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POPULATION ESTIMATES FOR THE COUNTRIES OF THE WORLD FROM 1914 TO 1920

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What is the present population of the United States? Over 100 millions. *How do you know? The last census gave it but 92.* Well, that was four years ago, and we have grown since then. *Yes, of course, but are you not guessing when you get away from the official census-figures?* In a sense, yes, but it is quite certain that our population did not stop growing in 1910 and that 92 million is *not* our present population. *May be, but we shall not know till 1920 how fast we have grown. In the meantime all that we know is that it is larger than 92 million.* No: there are really other reliable sources of information beside the census. We really *knew* in the early months of 1910, before the census had been taken, that the United States had grown. If the officials of that census had declared as their result that the country had lost people since 1900, we should have been quite justified in questioning their work. For, while it is true that the only way to ascertain the number of a people is to count them, the *increase* or *diminution* of population can be read by far easier signs, the plainest signs of increase being the active building of houses, the crowding of schools, the coming of immigrants, and the general activity of commerce in food and clothing.

All countries in the world that have a regular census show an unfailing growth of population—even through great wars like our

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Civil War and the Franco-German War of 1870—excepting only India between 1861 and 1871 and Ireland, if Ireland can be called a country. British and American statistics have long made the exodus of the Irish to America familiar. British India had a population in 1861 of 196 millions, which ten years later had become 195.8 millions, a small but distinct loss of people. But in these two cases *other knowledge than that derived from the census* gives an adequate explanation. Famines in India are so notorious that one is astonished to learn that that is the only decade in which the Indian population did not increase and that in that one it diminished so little. Humanely speaking, the diminution of population by 200,000 is an appalling disaster; numerically it is a slight part of 196 millions and only striking because normally that country should increase by a million or two a year. Growth of population is so sure and normal in all countries that it habitually masks the losses from war and famine.

But not merely is growth normal to all modern nations, but that of the United States has long been known to be unusual and abnormally great. Anyone who is not familiar with the fact, if there be anyone, might glance at the graphs for population growth on Plate 14 of the Statistical Atlas of the United States for 1900. Moreover, the manner and the reasons for the extraordinary growth of the United States are well known. There is no need to enlarge on a thing so familiar; it suffices to state briefly that our birth rate, though dwindling, is still greater than our death rate, and a great flood of European immigration has set our way for more than half a century. Of those who come more than half a million now stay with us each year. Quite independently of the census figures of 1910, we may say we know beyond any doubt that our population is increasing quite as rapidly as it did from 1900 to 1910. In all probability it is increasing faster.

Generally it is safe to say that a country will increase as rapidly in a new decade as it has in the past, unless some widespread and mighty cause prevents, which, to be operative, must be of sufficient magnitude to be matter of universal knowledge. In face of the fact that all countries are growing and that our growth is much greater than that of other nations, it is clear that only some calamity greater than the Civil War could have given us a smaller population in 1910 than we had in 1900. On the other hand it is quite inadmissible to keep on using the figures of one census until they are replaced by those from the next one.

The simplest way to make such estimates as those shown in the following tables is to construct diagrams of growth of population for the decade 1900-1910 and extend the line to 1920. The appended diagram (Fig. 1) shows such population graphs for the United States and the United Kingdom for the last five decades. The extension of the line of each decade allows comparison of such estimates with the facts since ascertained by census counts. The estimates of the tables are readings for the several years on such graphs.

Let me disclaim any intention of prophecy. *To-day* the tabular value for any country is a fair ground for stating that the population in that country is now greater than that number. Whatever we know about the events of that country since 1910 must assist us in judging how much greater. To take the value for 1920 from the table now and say that in that period, after six years of whose course we can yet know nothing, the population *will be* so and so, is to misuse it. *If population grows just as in the last decade,* we shall have those figures for the facts of 1920; but that is not at all likely, though not so far from likely as that population anywhere will remain unchanged.

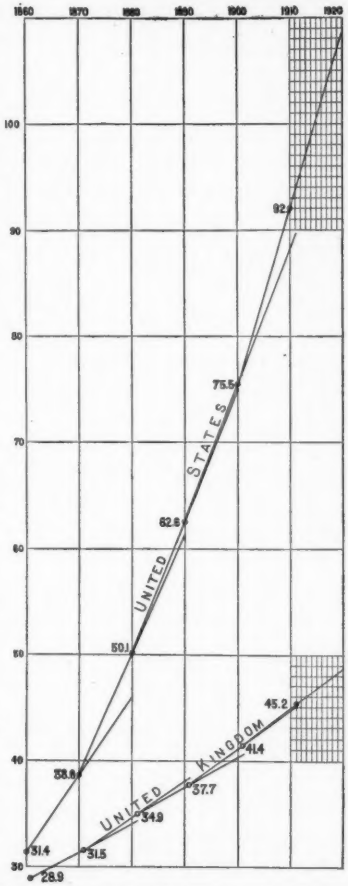

FIG. 1—Diagram showing the growth of population of the United States and the United Kingdom from 1860 to 1920. The vertical divisions represent periods of ten years; the horizontal divisions, millions of population. The population at each census is given opposite the small circle which represents it on the line of population growth. The line for each decade is extended beyond its period to allow of comparison with the actual growth. The line for 1910–1920 represents estimated growth on the basis of previous growth.

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TABLE I. ESTIMATED POPULATION OF AMERICA IN MILLIONS FROM 1914 TO 1920

	1914	1915	1916	1917	1918	1919	1920
Newfoundland	.2	.2	.2	.2	.2	.2	.2
United States	98.5	100.2	101.9	103.5	105.1	106.9	108.4
Canada	7.7	7.9	8.1	8.3	8.5	8.6	8.8
Mexico	15.8	15.9	16.1	16.3	16.4	16.6	16.7
Guatemala	2.1	2.2	2.2	2.3	2.3	2.4	2.4
Salvador	1.2	1.2	1.2	1.3	1.3	1.3	1.4
Nicaragua	.6	.7	.7	.7	.7	.7	.7
*Honduras	.5	.5	.5	.5	.5	.5	.6
Panama	.4	.4	.5	.5	.5	.5	.5
Costa Rica	.4	.4	.4	.4	.4	.4	.4
NORTH AMERICA	127	130	132	134	136	138	140
Bahamas	.06	.07	.07	.07	.07	.07	.07
E. British Antilles	.8	.8	.8	.8	.8	.8	.8
Jamaica	.9	.9	.9	.9	.9	.9	.9
*Haiti-Santo Domingo	3.2	3.3	3.4	3.4	3.5	3.6	3.6
French Antilles	.4	.4	.4	.4	.4	.4	.4
Cuba	2.4	2.4	2.5	2.6	2.6	2.6	2.7
Porto Rico	1.2	1.2	1.2	1.2	1.2	1.2	1.2
WEST INDIES	9	9	9	9⅛	9⅛	9⅛	9¾
British Guiana	.3	.3	.3	.3	.3	.3	.3
French Guiana	.05	.05	.05	.05	.05	.05	.05
Dutch Guiana	.08	.08	.09	.09	.09	.09	.09
*Colombia	4.4	4.4	4.5	4.5	4.5	4.5	4.6
*Venezuela	2.8	2.8	2.8	2.8	2.8	2.9	2.9
*Ecuador	1.5	1.6	1.6	1.6	1.6	1.6	1.6
*Peru	2.8	2.9	2.9	2.9	2.9	2.9	2.9
Brazil	18.5	18.7	19.0	19.3	19.6	19.9	20.1
*Paraguay	.8	.8	.8	.8	.8	.8	.9
*Bolivia	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Chile	3.4	3.4	3.5	3.5	3.5	3.6	3.6
Argentine Republic	7.8	8.0	8.3	8.4	8.6	8.8	9.0
Uruguay	1.1	1.1	1.1	1.1	1.1	1.1	1.2
SOUTH AMERICA	46	46⅛	47	47⅛	48	49	50
ENGLISH AMERICA	106½	108½	110	112	114	116	117½
COLONIAL AMERICA	6—	6—	6	6	6	6	6½
LATIN AMERICA	70	71	72	73	74	75	75½
AMERICA	182	185	188	191	194	197	199½

* Starred values are less reliable.

The accompanying diagrams (Figs. 2 to 5) show the recorded population growth of all the principal countries of America from 1880 to 1910 and their estimated growth from 1910 to 1920. The values in Table I are taken from this second part of the diagrams.* In addition to the estimates for each American country, summed data are given in the tables, and the corresponding curves shown on the diagrams, for North America, South America and the West Indies, and also for English America, Colonial America and Latin America—three essential classifications of American peoples.

English America includes Newfoundland, Canada and the United States. The people are typically of pure European race. They cut

* Figures 2 to 5 were originally intended to accompany an earlier paper by the author dealing only with the population estimates for America. When it was expanded into its present form the figures in Table I were revised; they may, therefore, not always tally strictly with the diagrams (*e.g.*, Cuba, Fig. 3).—ED.

the forests, till the soil, man the factories, invent, buy, sell, cultivate the arts, practice the professions, and govern themselves, without having any permanent peasant class or peasant occupations, which is still more important.

Colonial America embraces British Honduras and the Guianas, Jamaica, the Bahamas, Guadeloupe and Martinique, the east British Antilles (by which are meant mainly St. Kitts, Nevis, Montserrat, Antigua, Dominica, St. Vincent, Grenada, the Grenadines, Tobago, Barbados and Trinidad), together with the independent island of Haiti-Santo Domingo. The people are typically descendants of African slaves, a small, very small minority of white Europeans being sent from the Old World to the higher governing positions. The government is strong and orderly, but it is not self-government. The mass of the people are peasants. They do all the labor but have little to do with art or science or even industry or commerce, which are in a backward state. Haiti and Santo Domingo are not strictly in this class, as they have no European overlords, but the mass of the people belong to the same type. Only the European masters are lacking, whom they threw off long ago. Now they may be said to enjoy local misgovernment. Their governments are neither strong nor orderly.

Latin America consists of Mexico, Central America, Cuba and Porto Rico, and all of South America except the Guianas. It is inhabited in part by Spanish- or Portuguese-American creoles—who claim to have only traces of Indian blood—and in much greater part by native American races or half-breeds. These constitute a true peasant class, which performs all the heavy labor now, just as it did before the Europeans came. Neither law nor fixed custom bars them from participation in the government, yet as a general thing the mass of them have no part in it.

The presence of nearly 10 million blacks in the southern United States (as also in Brazil and Cuba) is not typical of English America but exceptional, giving their region a special character, socially and economically. The blacks are not increasing as fast as the southern whites, nor even as the whites of the whole country. This appears in part from the curves on Figure 2. The blacks now number 10 millions, the whites 86, but unlike the whites, the blacks increased more slowly in the last decade than in the previous one. They were a seventh of the population in 1880, in 1910 less than a ninth.

Of English Americans in 1914 there are over 106 millions, of

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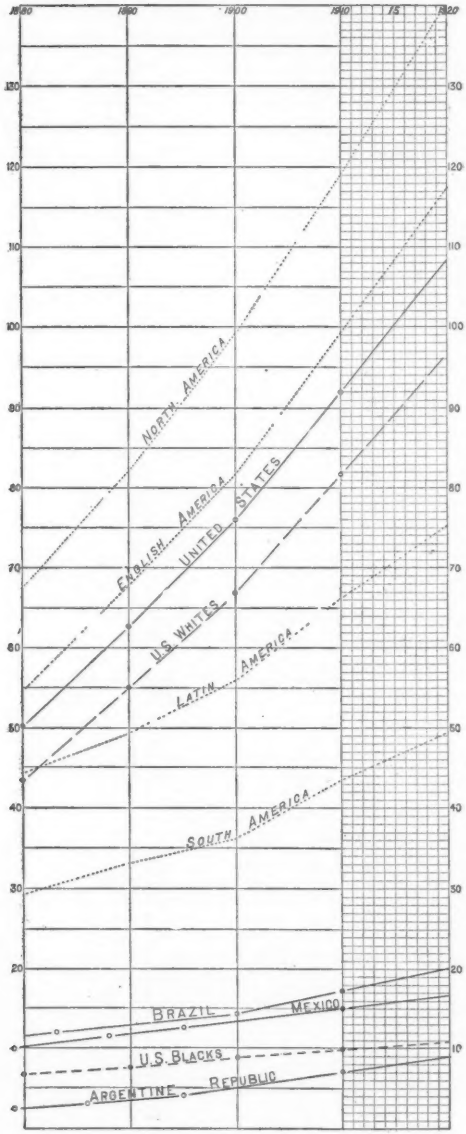

FIG. 2—Diagram showing populations for 1880, 1890, 1900, and 1910, by solid lines, of the United States, Brazil, Mexico and the Argentine Republic; by broken lines, of United States whites and United States blacks; and by dotted lines, of North America, English America, Latin America and South America. All lines are continued straight on to 1920, the right hand vertical line of the diagram, the horizontal lines representing millions of people. For the last decade lines are drawn for every year and for every million people. The small circles represent census years.

Colonials 6, and of Latins 70. Almost all are small nations except the United States, Brazil with 19 millions, Mexico with hardly 16, thanks to years of revolution, and the Argentine Republic with 8, now beginning to surpass Canada in population.

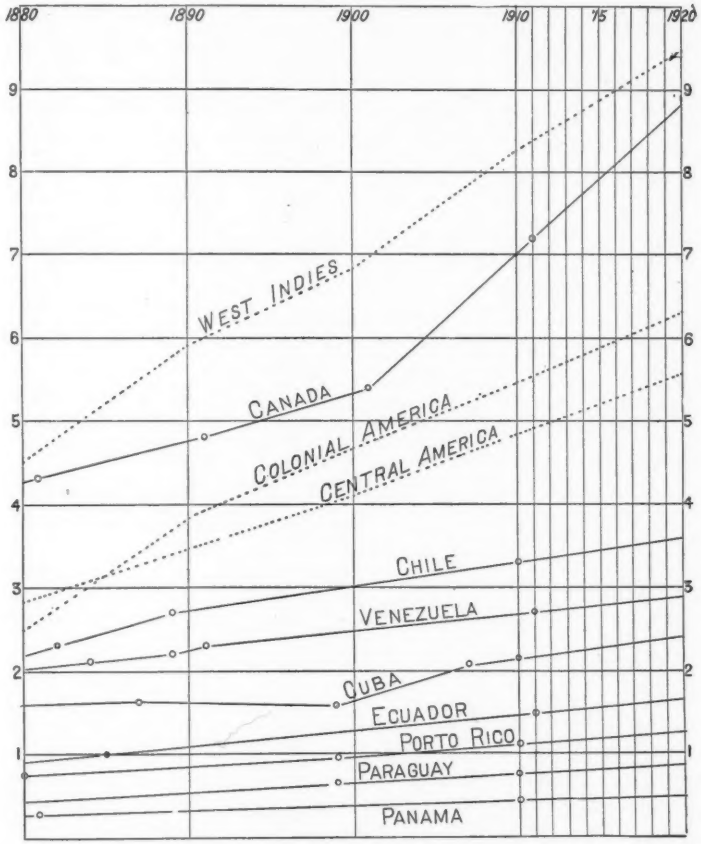

FIG. 3—Diagram showing the growth of population, from 1880 to 1920, of Canada, Chile, Venezuela, Cuba, Ecuador, Porto Rico, Paraguay, Panama and, in dotted lines, of the West Indies, Colonial America and Central America. The symbols are the same as in Fig. 2.

The data from different countries differ greatly in reliability. In English and Colonial America, excepting always Haiti and Santo Domingo, census counts are made of excellent quality. In a good part of Latin America censuses in our sense of the word are said to

be unknown. What is used is an enumeration by local authorities, a sort of summation of local estimates. In the Argentine Republic, Uruguay and Chile the figures are felt to be valuable and approximately correct. In Peru or Ecuador we have little more than opinions. A "census" was taken in Peru in 1876, with the result of a population of 2,699,945. At present the London Stock Exchange calls it 4,000,000, while "the Peruvian government are of opinion that the population is under 3,000,000." People on the spot question whether the population is growing much. The line representing Peru in Figure 4 will be seen to take into account the one census

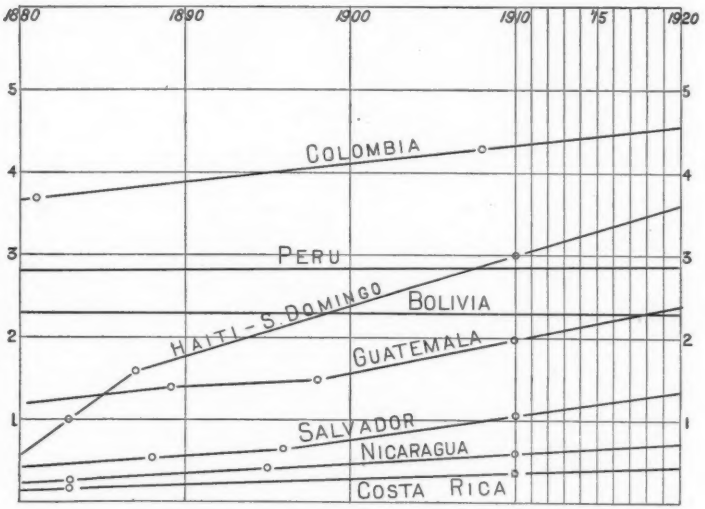

FIG. 4—Diagram showing the growth of population, from 1880 to 1920, of Colombia, Peru, Haiti-Santo Domingo, Bolivia, Guatemala, Salvador, Nicaragua, and Costa Rica. The symbols are the same as in Fig. 2.

and the government opinion. This makes the population 2.71 million in 1880 and 2.83 in 1910, by the assumption of a very slow growth. In every case all known estimates were plotted, the chief authorities being Supan's *Bevölkerung der Erde* and the *Statesman's Yearbook*.

The line for Haiti-Santo Domingo on Figure 4 is interesting as showing a very suspicious rapidity of increase. The same remark applies to Ecuador on Figure 3. In neither case is there anyone disposed to vouch for the data. For Honduras successive estimates were so discordant that a gentle increase was assumed and a line

drawn about midway among the plotted points (Fig. 5). Possibly better values for Haiti and Ecuador would have been obtained in the same way, assuming the first to range from 1.2 to 1.5 millions in the four decades and the second from 1.5 to 2.

It is true for some of these countries that the population is guessed at. It is *not* true that one guess is as good as another, as Minister Rockhill showed for China long ago.

There is no necessity that all these population lines must always rise. A country may diminish in population. Cuba claims to have done so just before the Spanish war, as the line for Cuba on Figure 3 shows. Paraguay, too, has long had a tale to tell of heavy population losses in her war, but many of her oft-cited figures are now questioned. The best counted countries do not show losses.

In Table I an asterisk marks the countries where there is least knowledge. As the unit of the whole inquiry is a million people, British Honduras and the Dutch and Danish West Indies are too small for inclusion. Roughly I believe the probable error of the estimates may be about five per cent. for Latin America and two for the totals of America. On the diagrams the numbers are plotted to the nearest ten thousand, but only the hundred thousands are given in the table as even that appears to claim too much exactitude.

TABLE II. ESTIMATED POPULATION OF EUROPE IN MILLIONS FROM 1914 TO 1920

	1914	*1915*	*1916*	*1917*	*1918*	*1919*	*1920*
*Albania	.9	.9	.9	.9	.9	.9	.9
Austria-Hungary	50.7	51.2	51.5	51.9	52.4	52.7	53.1
Belgium	7.8	7.8	7.9	8.0	8.1	8.2	8.2
*Bulgaria	4.8	4.8	4.8	4.9	4.9	4.9	4.9
Denmark	2.9	2.9	2.9	2.9	2.9	2.9	2.9
France	39.7	39.8	39.8	39.9	40.0	40.1	40.2
German Empire	68.1	69.0	69.7	70.6	71.5	72.4	73.2
*Greece	4.6	4.6	4.7	4.7	4.8	4.8	4.8
Italy	35.3	35.6	35.7	36.0	36.2	36.4	36.6
*Montenegro	.5	.5	.5	.5	.6	.6	.6
Netherlands	6.1	6.2	6.3	6.3	6.4	6.4	6.5
Norway	2.5	2.5	2.5	2.5	2.5	2.6	2.6
Portugal	5.6	5.6	5.7	5.7	5.7	5.7	5.7
*Rumania	7.6	7.7	7.9	8.0	8.1	8.2	8.3
*Russia in Europe	148.2	150.5	152.8	155.0	157.4	159.5	161.8
*Servia	4.3	4.4	4.4	4.5	4.5	4.5	4.6
Spain	20.0	20.1	20.2	20.3	20.4	20.5	20.6
Sweden	5.7	5.7	5.8	5.8	5.8	5.9	5.9
Switzerland	3.8	3.9	3.9	4.0	4.0	4.1	4.1
*Turkey in Europe	1.6	1.6	1.6	1.6	1.6	1.7	1.7
United Kingdom	46.2	46.7	46.9	47.2	47.6	47.8	48.2
EUROPE	467	472	476½	481	486	491	495½

* Starred values are less reliable.

European statistics in general are good and these estimates are probably quite close to the truth. Of Turkey there is, of course, little known. Our values for the whole Balkan region are based on

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W. L. G. Joerg's careful study[1] in the *Bulletin* for November, 1913, the rate of increase being taken about as in the same part of Europe during the previous decade. For Russia, the only "census" was made in 1897, but official estimates are often made. The table contains the estimates for Russia in Europe, by which is understood all the territory belonging to the empire between Baltic, Arctic, Black, and Caspian Seas, separated from Asia by the crests of the Urals and the Caucasus. The reader who looks up Russia in the *Statesman's Yearbook* should be warned that separate values are there given for "European Russia," Poland and Ciscaucasia, and also,

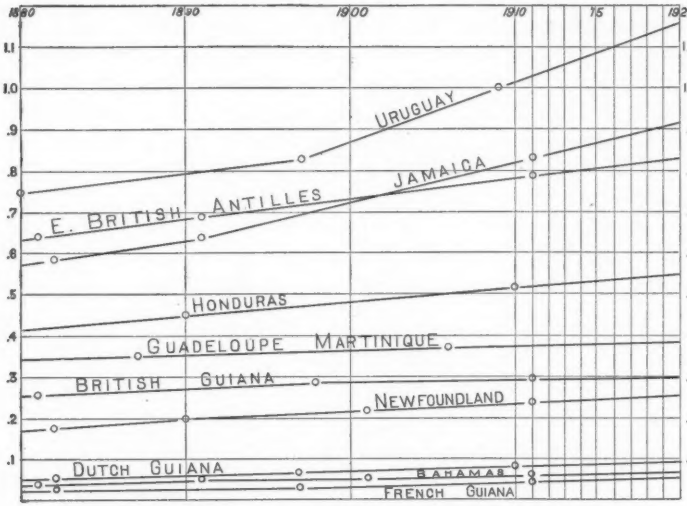

FIG. 5—Diagram showing the growth of population, from 1880 to 1920, of Uruguay, the East British Antilles, Jamaica, Honduras, Guadeloupe-Martinique, British Guiana, Newfoundland, Dutch Guiana, the Bahamas and French Guiana. The symbols are the same as in Fig. 2, except that the horizontal lines represent tenths of a million people.

but after the Russian Empire, for Finland, and all four must be added to get our Russia in Europe. The separation of the empire into two parts is of course arbitrary. The empire is one and undivided. Estimates for the whole are, in 1914, 175 millions, in 1915, 178, in 1916, 180, in 1917, 183, in 1918, 186, in 1919, 188, and in 1920, 191 millions.

It appears from the table that Russia in Europe, Austria-Hungary and the German Empire contain half the people of Europe, and

[1] The New Boundaries of the Balkan States and Their Significance, *Bull. Amer. Geogr. Soc.*, Vol. 45, 1913, pp. 819–830.

that the Russian Empire has about as many inhabitants as North and South America with the West Indies.

TABLE III. ESTIMATED POPULATION OF AUSTRALASIA IN MILLIONS FROM 1914 TO 1920[2]

	1914	*1915*	*1916*	*1917*	*1918*	*1919*	*1920*
Australia	4.4	4.5	4.6	4.6	4.7	4.8	4.8
Tasmania	.2	.2	.2	.2	.2	.2	.2
New Zealand	1.1	1.1	1.1	1.1	1.2	1.2	1.2
*New Guinea	1.1	1.1	1.1	1.1	1.2	1.2	1.2
Melanesia	.7	.7	.7	.7	.7	.7	.7
Micronesia	.1	.1	.1	.1	.1	.1	.1
Polynesia	.3	.3	.3	.3	.3	.3	.3
AUSTRALASIA	8−	8	8+	8+	8½	8½	8½

* Starred value is less reliable.

Melanesia is Supan's term and in Stieler's Atlas is found to include the islands from New Guinea to Fiji and Tonga. Micronesia includes the Caroline and Mariana Islands, the Marshall, Gilbert, and Ellice Islands, etc., while Polynesia includes Hawaii, and Palmyra and Christmas Islands.

The whole of Australasia has about the same population as the Argentine Republic or Canada. The data here are mostly good except for New Guinea, which is barbarous and unexplored. Usually such regions have fewer people than are at first supposed.

TABLE IV. ESTIMATED POPULATION OF ASIA IN MILLIONS FROM 1914 TO 1920

	1914	*1915*	*1916*	*1917*	*1918*	*1919*	*1920*
*Turkey in Asia	21.8	22.1	22.4	22.6	22.9	23.2	23.5
Cyprus	.3	.3	.3	.3	.3	.3	.3
*Free Arabia	1.1	1.1	1.1	1.1	1.1	1.1	1.1
British Arabia	.3	.3	.3	.3	.3	.3	.3
*Persia	9 6	9.7	9.7	9.8	9.8	9.8	9 9
*Afghanistan	6.2	6.4	6.5	6.6	6.7	6.8	6.9
Russia in Asia	32.2	32 7	33.2	33.8	34.4	34.9	35.5
*Khiva and Bokhara	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Japan	53.4	54.0	54.6	55.2	55.8	56.4	57.0
Korea	14.0	14.3	14.6	14.8	15 1	15.4	15.7
*China	313.6	314.1	314.6	315.2	315.6	316.2	316.7
Foreign China	1.6	1.6	1.7	1.7	1.7	1.8	1.8
*French Indo-China	17.1	17.2	17.4	17.4	17.6	17.7	17.8
*Siam	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Straits Settlements	1.8	1.8	1.8	1.9	1.9	1.9	1.9
*Himalayan States	4.0	4.1	4.2	4.2	4.3	4.3	4.4
British India	321.2	323.2	325.3	327.3	329.3	331.3	333.4
Portuguese and French India	.8	.8	.8	.8	.8	.8	.8
British Indian islands	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Sundas and Moluccas	39.0	39.2	39.4	39.6	39.8	40.0	40.2
Philippines	8.6	8.7	8.8	8.9	9.0	9.1	9.2
ASIA	857½	862½	867½	872½	877	882	887

* Starred values are less reliable.

[2] Mr. Chas. Stratton, assistant in the Geography Department of the State Normal College at Ypsilanti, did the most laborious part of gathering data for Australasia, Asia and Africa.

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There is a large margin of doubt as to the number of people in this continent. China, which surely contains a third or more of the total, offers only rude estimations. Minister Rockhill's studies long since made it clear that there were less than 400 millions, and the "family" census of 1910 suggests somewhat more than 310 millions. The figure has been taken at 312 in 1911 and an increase assumed distinctly slower than in British India, a country of similar size, but with good government and protection from some of the many agencies of destruction now operative in China. Other regions of little knowledge are starred on the table. In none of these have censuses been taken.

TABLE V. ESTIMATED POPULATION OF AFRICA IN MILLIONS FROM 1914 TO 1920

	1914	*1915*	*1916*	*1917*	*1918*	*1919*	*1920*
*Tripoli	1.0	1.0	1.0	1.0	1.0	1.0	1 0
Egypt	11.8	11.9	12.0	12 2	12.3	12.4	12.5
Egyptian Sudan	3.1	3.2	3.2	3.3	3.4	3.4	3.5
*Eritrea	.5	.5	.6	.6	.6	.6	.6
*Abyssinia	8.0	8.0	8.0	8.0	8.0	8.0	8.0
British Somaliland	.3	.3	.4	.4	.4	.4	.4
French Somaliland	.2	.2	.2	.2	.2	.2	.2
Italian Somaliland	.4	.4	.4	.4	.4	.4	.4
British East Africa	4.3	4.4	4.4	4.5	4.6	4.6	4.7
Uganda	3.2	3.3	3.4	3.5	3.6	3.8	3.9
*Tunis	2.0	2.0	2.1	2.1	2.1	2.2	2.2
Algeria	5 4	5.4	5.5	5.5	5 5	5.6	5.6
*Morocco	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Madeira, C. Verde and Azores	.6	.6	.6	.6	.6	.6	.6
Canaries	.4	.5	.5	.5	.5	.5	.5
*Sahara	.8	.8	.8	.8	.8	.8	.8
*French West Africa	17.9	18.2	18.6	18.9	19.3	19.6	20.0
*Gambia	.2	.2	.2	.2	.2	.2	.2
*Portuguese Guinea	.8	.8	.8	.8	.8	.8	.8
*Sierra Leone	1.5	1.5	1.5	1.5	1.6	1.6	1.6
*Liberia	2 0	2.0	2.0	2.0	2.0	2.0	2.0
*Gold Coast	1 4	1.4	1.4	1.4	1.4	1.4	1 4
Togo	1.0	1.0	1.0	1.0	1.1	1.1	1.1
*Nigeria	25.3	25.4	25 5	25.6	25 7	25.8	26.0
Kamerun	3.0	3.2	3.3	3.4	3.5	3.6	3.7
*French Congo	9.3	9.4	9.6	9.7	9.8	9.9	10.0
*Spanish Guinea	.2	.2	.2	.2	.2	.2	.2
*Congo State	15 0	15.0	15.0	15.0	15.0	15.0	15 0
German East Africa	10.8	11 1	11.4	11.6	11.9	12.1	12.4
Zanzibar	.2	.2	.2	.2	.2	.2	.2
*Mozambique	3.3	3.4	3.4	3.5	3.6	3.7	3.7
*Angola	4.2	4.2	4.3	4.3	4.3	4.3	4.4
*German Southwest Africa	.1	.1	.1	.1	.1	.1	.1
British South Africa	9.9	10.1	10.3	10.5	10.6	10.8	11.0
*Madagascar, etc	3.4	3.5	3.5	3.6	3.6	3.6	3.7
British islands near Madagascar	.4	.4	.4	.4	.4	.4	.4
AFRICA	155	157	159	160½	162	164	166

* Starred values are very doubtful.

The estimates for three quarters of Africa are very doubtful ones. It is easy to note, however, the steady additions to fairly good data, commonly reducing the numbers formerly assigned. For Morocco recent examination of the most populous parts has brought the estimate down to a third of that formerly made.

The total for Africa, like that for Asia, is probably too large, while those for Europe, Asia and Australia are too small. By continents there result in 1914 the following:

North America...	136+	(with islands)
South America...	46+	
Europe	467+	
Asia	857—	
Africa	155—	
Australasia	8+	
The World.....	1,669 millions	

A GEOGRAPHICAL STUDY OF NOVA SCOTIA*

By R. H. WHITBECK
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Two hundred years ago Nova Scotia was nearly if not quite as promising a colony as Massachusetts. Its position was more strategic. Its climate was as good and its resources were superior. Massachusetts has no equal area of farm land as fertile as the Annapolis Valley. It has a longer coast line, fringed with harbors. Louisbourg, the French stronghold on Cape Breton Island, was scarcely second in importance to Quebec. Halifax was founded and fortified by England in 1749 as a counterpoise to the French Louisbourg, and the taking of this fortress by the New England troops was one of the great events of colonial history. Port Royal on the Bay of Fundy was the first permanent settlement in North America north of Florida. The importance attached to Port Royal is shown by the fact that it was five times taken by the English, unsuccessfully attacked by them three times, and by the French and Indians twice. It was sacked and abandoned twice, once by pirates and once by United States Revolutionary troops. The ruins of its fortifications cover 28 acres. After the Revolutionary War, more than 25,000 people—the United Empire Loyalists—left the states and selected Nova Scotia and New Brunswick for their home. Even in 1800 most people saw as prosperous a future for New Scotland as for New England. Writing in 1787, Hollingsworth says in his book on Nova Scotia:

"This country [Nova Scotia], as has been already observed, may be justly esteemed the first in the American world, with respect to

* Read at the Tenth Annual Meeting of the Association of American Geographers at Princeton, January 1 and 2, 1914.

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that situation, whether in peace or war, which a great maritime power, possessed also of settlements in the West Indies, would wish to retain and improve."

Yet to-day the total population of Nova Scotia is less than that of Boston, and its average density is equal to that of Oklahoma. There are ten cities in Massachusetts any one of which manufactures more than Nova Scotia, and the semi-annual *profits* of the United States Steel Corporation in time of active business would pay for the total yearly manufactures of Nova Scotia.

Nova Scotia lies nearer Europe than does New England; it was settled by the best of European stocks, English, Scotch and Germans, and some Irish, with a large admixture of New Englanders. It has ample supplies of coal and limestone at the water's edge, while only a day's run to the north are the iron mines of Wabana, Newfoundland, also at the water's edge. Moreover, the province lies at the entrance to the River and Gulf of St. Lawrence, the gateway into Canada.

If a rigorous climate, thin soil, Atlantic waterfront, many harbors and North European stock account for the phenomenal development of New England, why have these same factors not led to similar results in Nova Scotia? And still more, since the latter has coal and the former has none?

General Geographical Conditions in Nova Scotia

The province has 21,000 square miles, more than half of which is forest well culled and much injured by fires. Three-eighths of the land is in farms, but half of this is wooded. Not over 20 per cent. of the total area is suitable for farming. The peninsula is peneplained to a relief of about 400 feet in the south, rising to nearly 1,000 feet in Cape Breton; it is underlain in part by ancient slates and quartzites, intruded by massive batholiths of granite and is also underlain by Paleozoic rocks. The entire surface was thoroughly scraped by glaciers and the southeastern shore is deeply fiorded. The coal measures are in Cape Breton Island and along the shore of Northumberland Strait. Parallel to the Bay of Fundy runs the high trap ridge known as North Mountain, of the same origin and age as the trap ridges of New Jersey and the Palisades of the Hudson. Opposite this and eight miles away extends the granite wall of South Mountain, and between lies the paradise of Nova Scotia, the Cornwallis-Annapolis Valley, eroded in the soft red shales of the Triassic. This is the principal valley of the province, the home of prosperous and well-housed farmers and apple growers. The granite and quartzite knobs are bare, the soil

on the slopes is thin, and most of the crops are grown near the roads on the so-called interval, or valley, land, or on the rich tide-marsh reclaimed from the sea by the dikes which the Acadians built or taught others to build. These reclaimed lands are made of sea mud washed into the estuaries by the powerful tides. They are the most valuable meadow lands of the province, producing as high as three tons of hay to the acre year after year. The general aspect of much of the country, with its wide stretches of cut-over and burned-over land, is not prepossessing. The farm houses are small and crops are light. The average farm of the province is valued at about $2,000 and it produces from $300 to $500. The Cornwallis-Annapolis Valley, eighty miles long and eight wide, is almost a continuous orchard. Protected on the north and south by mountain walls of considerable height and possessed of rich red soil, it is ideally suited to apple growing, and annually exports $2,000,000 worth of fruit. A single tree is officially reported to have borne 35 barrels in one year.

Next after the valley, the area of Paleozoic rocks in the north, bordering on Northumberland Strait, is agriculturally best developed. The part of the province that faces the Atlantic is the poorest and half of this is a wilderness traversed by no railroad. Even Halifax County is so little developed that it is one of the chief moose-hunting grounds of the province. Despite the continuous fringe of harbors, there is but one important port, Halifax. The port of Lunenburg in the German settlement is the chief fishing center.

The Fisheries. The nearness of the fishing banks, the many-harbored coast and the scanty soil had the same influence in Nova Scotia as in New England. In both regions these influences bred a race of boat-builders, fishermen and sailors. In the days of wooden ships, the coast of Nova Scotia, like the coast of Maine, was busy with the building of sailing vessels, and, like those of Maine, many of the shipyards of Nova Scotia are now idle. But the influence of the fisheries has left its impress upon almost every phase of the life of the province, and fishing is now and will continue to be one of the principal industries. In registered tonnage per capita, Nova Scotia vies with Norway.

The Mines. One of the few places in the world where coal is mined at the sea shore, in fact two miles out under the sea, is in Nova Scotia. The Sydney coal field in Cape Breton occupies 200 square miles and is bounded on three sides by salt water. In Pictou County are seams 24 to 30 feet thick. Nova Scotia pro-

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duces two-thirds of the coal mined in the Dominion. The coal from the Sydney mines in Cape Breton is taken to Quebec and Montreal on specially constructed steamers at a small cost per ton. Off the eastern coast of Newfoundland is the strange little island of iron ore whose beds dip under the sea, so that the major part of the ore properties are submarine. How much coal and iron have been put beyond men's reach by the sinking of the land at the mouth of the St. Lawrence no one can tell. At the Sydneys and at New Glasgow are the largest smelting and steel plants of the Dominion. Here on the shore of the Gulf of St. Lawrence the iron ore and coal meet under many favorable conditions of location. It looks as if iron and steel production and the subsidiary industries which live on the steel mills have a future here. Already a little Pittsburg has grown up. If it does not grow into a big Pittsburg it will be the fault of men, not of geography.

All told the extractive industries yield $25,000,000 a year, the value of two dreadnoughts. The value of all manufacturing is $40,000,000 to $50,000,000 a year, with iron and steel the leading item.

Railroads. The railroads of Nova Scotia are probably as numerous and as good as conditions will warrant, but they do not remind you of the Pennsylvania. The government-owned Intercolonial Line crosses the province and terminates at Halifax. It runs two good trains each way daily, one even on Sunday. This Sunday train is a special concession to an unwelcome demand from outside and is not popular in the province. Sunday trains or boats in the Maritime Provinces are not countenanced. However, changes of great moment are under way. The Canadian Pacific has obtained the Dominion Atlantic Line which connects Digby on the Bay of Fundy with Halifax on the Atlantic. This may mean that Halifax is to become the principal Atlantic port of the great Canadian Pacific system. It is understood also that this will be the Atlantic terminal of the Grand Trunk Pacific when it is completed. Vast terminal improvements involving $35,000,000 are now in progress at Halifax, and the people of the old town are slowly getting into a new frame of mind. They see a future for their city.

So much for the material side of the neglected province of Nova Scotia—the province that has been passed by. In its material aspects there is nothing that rises above the ordinary, but there is a side to its history which looms above the commonplace and to this I now ask your attention.

The People. It is not necessary that, when wealth increases,

men decay. It is not a demonstrated law that bare hills, or poor land or a rigorous climate are the necessary environment wherein to breed *men,* but it is a law that a land of great material prosperity, teeming with industry and wealth, attracts its young Alexanders and Shakespeares into the world of business, and they become Harrimans, Morgans, and Rockefellers. Not so with a land placed and endowed like Nova Scotia. Into this province there was a migration of some of the same stock that made New England, and into it there came thousands of Scotch, mostly highlanders. From such scions as these, men are bound to grow, and if the material activities of their country can not absorb their energies, then those energies are turned into other channels. Nova Scotia is, as its name warrants, a Scotchman's province. In Halifax I met the chief engineer in charge of the great harbor and terminal improvements; his name is MacGregor. I met the President of Dalhousie, the leading collegiate institution; his name is Mackenzie. He gave me the opportunity of meeting his right-hand men on the board of trustees; their names are Campbell, McInnes and Mitchell. The provincial premier is George Murray and the Lieutenant Governor is J. Drummond MacGregor.

Nova Scotia has long been the unchallenged leader in Canada in the production of statesmen and scholars. It has furnished three of the premiers of the Dominion, the present incumbent being a Nova Scotian. It has furnished a major part of the college presidents for the rest of Canada. Pictou County is the center of the Scotch population, and this single county has supplied a list of college professors and college presidents that would do credit to a province. From this one county, nine men are now serving or recently have served as college presidents, and as prominent college professors, 18 others, not to mention educators of lesser standing. I met a man whose position and income is that of a railroad ticket agent in a city of 8,000 people. He seemed to regard it as not worthy of comment that all of his four sons have gone through college or are going through. Undoubtedly the richest product of this little province is *men,* men whom it has educated and sent out to the rest of Canada and to the United States.

In striking contrast to Pictou County with its Scotch population, devoted to higher education and producing in a generation or two 27 college presidents and professors, is Lunenburg County on the Atlantic coast, settled in 1752, mainly by German farmers from the Palatinate and Hanover. Of its 30,000 population, in 1891, 9,000 could neither read nor write. They are an in-

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dustrious, thrifty and fairly prosperous people, but they are not making their sons into premiers or college presidents. The influence of the sea and of the fishing banks has made over a race of peasant farmers into the preeminent fishing population of Nova Scotia. And a people whose interests—created by their environment—seek occupation in fishing do not stress the intellectual side of life. It is a question which I ask and cannot answer: Suppose the same Scotch colonists who settled in Pictou County had, instead, settled in Lunenburg County, would they in that environment have produced the long line of illustrious men that they have produced in their present environment? It is the old question of racial stock *versus* environment in the making of men.

Nova Scotians are emphatically a religious people. Only 500 people out of the 500,000 are without church affiliation. The seating capacity of the churches practically equals the population. I was told of a recently enacted law in Halifax that limits the number of saloons to one for each thousand of the population. In Nova Scotia, Sunday is Sunday and business stops, trains stop and people go to church.

Isolation as a Consequence of Geographical Conditions

And now in conclusion: Why has Nova Scotia won the name of "the province that has been passed by?" Why is there such a contrast between the development and present life of New Scotland and of New England, so similarly placed and so similarly peopled? If the hard conditions of farming, the abundant waterpower, the momentum of an early start and the intelligence of the people of New England satisfy our quest for the reason of New England's industrial development, why do we not get a similar result in a province just across a political boundary? To me two reasons are clear. One is a matter of political geography and the other a matter of physical geography. The throbbing, buoyant, optimistic, aggressive life of the Republic is partly the fruit of our patriotism and of our faith in our country and partly the result of our exceptional opportunities. Our democratic institutions and our wealth of opportunity have drawn to us a steady stream of new blood always regarded as a menace when it was coming and as a blessing when a new current had set in. No such stream of optimism has until recently fed the life of Canada in general and not even yet, the Maritime Provinces. These provinces have never shared adequately in the economic development of the Dominion as a whole, and this appears to be, in large part at least, a result of their physical geography, mainly location. When the land at

the mouth of the St. Lawrence sank and admitted the sea a thousand miles up the valley, it fixed the commercial meeting place of land and ocean at the foot of the Lachine Rapids, at the island of Montreal. Between the coast of Nova Scotia and the attractive lands of Ontario and Quebec lies a long stretch of unattractive country. Nova Scotia is isolated, damagingly isolated from the real centers of Canadian activity, and politically cut off from its natural neighbor, New England. The great transcontinental railway lines did not find it necessary or expedient to terminate on the shore of Nova Scotia. Until the present, the ports of Montreal and Quebec, in summer, St. John and Portland, in winter, have been used, and Nova Scotia has been passed by. It has had no hinterland, and in this lies one of its greatest contrasts to Massachusetts. Despite its nearness to Europe, most of the Atlantic liners steam to the north up the St. Lawrence, or southward to ports which were more accessible from the interior, and these have received and dispatched the transatlantic trade of Canada. I have encountered no instance of a region seemingly so favorably situated for ocean commerce and which has proved up to the present to be so unfavorably placed.

Nova Scotia, the outpost of Canada on the Atlantic, the colony which was thought to have the best commercial situation in the American world, illustrates, when taken in connection with the St. Lawrence, the fact that it is not usually the point where the land juts farthest into the sea, but the point where the sea pierces farthest into the land, that offers the most advantageous place for the meeting of land and water routes. Canada has developed slowly, and Nova Scotia has been compelled to wait and seems to have been content to wait until the time when the growing industries and ocean trade of the Dominion should make the splendid harbor of Halifax a necessary winter terminal of its great continental railroads. This is now coming to pass. A new spirit of optimism is taking root in the province. The vigorous industrial life of Amherst, New Glasgow, Truro and the Sydneys is an object lesson in the possibilities which Scotia's coal and Newfoundland's iron, meeting under exceptionally favorable geographical conditions, can do for manufacturing and consequently for the whole economic life of the province. There is no boom on in New Scotland. They are not an effervescent people. Halifax is not Seattle. Yet they believe, and the visitor to their province comes to believe, that Nova Scotia is rounding a corner, and that geographical conditions, which, under a past regime, have retarded her growth, are now likely gradually to reverse their influence.

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THE EFFECT OF SEVEN YEARS' EROSION ON THE CALIFORNIA FAULT LINE OF 1906

By RULIFF S. HOLWAY
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The persistence for more than seven years of the minor surface features due to horizontal movement in 1906 along the San Andreas Fault has led to expressions of surprise even from some widely known students of earth forms. The movement in the part of the fault zone[1] to be discussed was practically horizontal and was in a region where no bare rock outcrops. At the time of the last faulting the land was largely a pasture interspersed with occasional small patches of low brush. The surface features due to the differential horizontal movement on the two sides of the fault plane are made largely by the fracturing and crumpling of the sod, frequently resulting in a low ridge such as that shown in Figure 2. The elevation of the ridge is slight, usually varying from a few inches to one or two feet above the general level. The width of this ridge is from three to ten feet. It was naturally expected that erosion would cause a rapid lowering of the little hummocks of the fault trace because of their small size, steep slopes, and exposure of unprotected soil in the breaks. Notwithstanding the softness of the material, observation now shows that at the present time, January, 1914, after seven years of rainfall, the fault trace in unplowed land may be followed as certainly and with nearly as little effort as it was followed in April, 1906. Recent plowing of the area shown in Figure 2 necessitates that comparison be made with the present aspect of the fault trace as it appears on the nearest slope with similar conditions. Figure 3, however, represents no exceptional instance of the present appearance of the fault trace, as it is one of six photographs taken during an hour's walk, all of which show the low ridge with equal clearness, the choice of Figure 3 being based on the closest approximation of the slopes to those in Figure 2. It will be seen that the main effect of the seven years' erosion has been merely the softening and rounding of the sharp edges of the broken sod. The fact that different localities are

[1] The San Andreas Fault emerges from the sea about ten miles south of the Golden Gate at Mussel Rock, a point designated on the San Mateo sheet, U. S. topographic map, and shown on Figure 1. The trace of the fault for the next four or five miles southeasterly along the hill tops is the portion directly considered in this paper.

represented in the figures precludes any estimation of the amount of reduction of the general elevation of the ridge as a whole.

Any surprise at this persistence of the minor surface features is not to be taken as an indication that the facts here described controvert opinions formed from proper consideration of the problem, for it may be merely the unconscious effect of the modern scientific view that all topographic forms are ephemeral phases in the geographic cycle. The problem has received but little attention

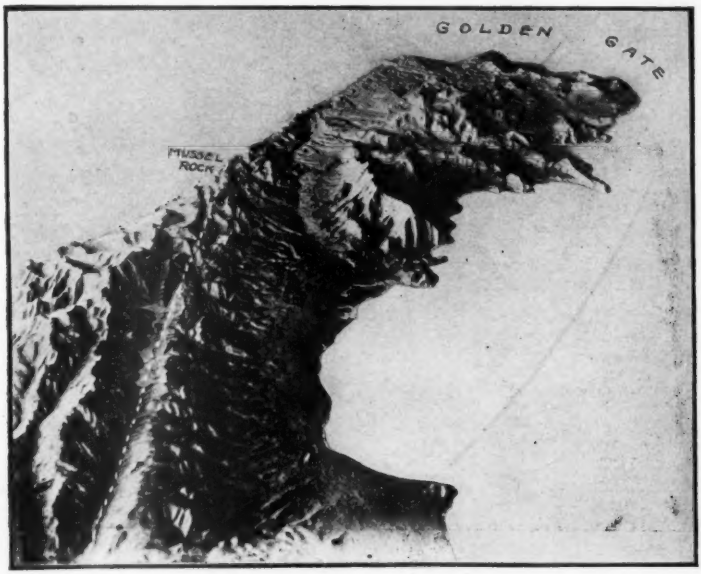

FIG. 1—Perspective View of a Model of San Francisco Peninsula. The coast line on which Mussel Rock lies runs almost due north and south; the Golden Gate trends east and west. The trace of the 1906 fault is shown by the line dotted in white. Original model by Professor A. C. Lawson.

hitherto, but the approximate determination in years of the period for the complete obliteration of the fault trace—both irregularities and ridge—is becoming a question of considerable interest and even of practical importance in the study of a region where faulting is frequently manifest at the surface. The only reference to the problem thus far noted is by Dr. G. K. Gilbert in his description of a portion of the San Andreas fault zone lying to the north-west of San Francisco.

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"The fault-trace, however, is a relatively perishable and transient phenomenon and its preservation might have comparatively definite meanings. At two localities I thought I discovered old 'traces' of the ridge type....The features are....too indefinite to be recognized in the [photographic] view. If these old traces have been properly identified they are of very moderate antiquity. I should suppose that the ridges of the recent trace would lapse to such a condition in four or five years and that they might persist, under pasture conditions, for two or three decades."[2]

FIG. 2—Trace of the San Andreas Fault as it appeared in 1906.

The condition of the fault trace at the present time indicates that the estimated period of four or five years is entirely too short, for "traces" of the ridge type to become so obscure as not to be recognized with certainty, for they are plainly evident in photographs taken after the expiration of seven years. The writer judges that there is strong probability that they will continue to be unmistakable for quite a number of years to come. The particular section of the rift under consideration has been traversed by the writer once or twice every year since 1906. The greatest change, the softening of the sharp edges of the broken sod, occurred, very

[2] The California Earthquake of April 18, 1906, Vol. I, p. 73. Carnegie Institution, 1908.

naturally, during the first two winters. From the physiographic standpoint it is unfortunate that the growth of San Francisco has caused the vegetable gardens to be pushed constantly southward and that much of the pasture land through which the rift passed is being brought under cultivation. The probability grows stronger that man will erase all features in this portion of the fault zone long before erosion would have obliterated them.

More distant sections of the rift to the northwest may be less

FIG. 3—Trace of the San Andreas Fault as it appeared in November, 1913. This locality is a little over a mile southeast of that in Figure 2, which has been plowed during the past year.

disturbed. It is hoped that somewhere along the fault zone at intervals of a few years careful observations may be made, supplemented by photographs which will show the successive stages in the process of final obliteration of the fault trace.

About eighteen miles distant from and approximately parallel to the San Andreas Fault is another known as the Haywards Fault. Movement along this line in 1868 resulted in a crack manifest at the surface for some twenty miles. The retracing of this line by observers having in mind the criteria furnished in April,

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1906, has not resulted in any report of the present existence of remains of a fault trace similar to that shown in Figure 2. However, the two fault movements are probably not comparable. The incomplete records of the 1868 movement on the Haywards Fault indicate that the horizontal movement, if it occurred, did not exceed three feet, while the movement in the San Andreas Fault in 1906 reached a maximum of twenty-one feet. It should also be remembered that along the 1906 rift the size and definiteness of the fault trace varied greatly in short distances and with the slope of the land. Consequently the failure to find signs of the fault trace of 1868 still existing does not conclusively prove that such traces of the 1906 fault may not persist for forty years or even double that period under favorable conditions.

As the rapidity of erosion is directly related to the amount and to the distribution of rainfall the data given below should be considered, especially if comparison is to be made with the duration of similar features elsewhere. The mean seasonal rainfall in San Francisco is 23.07 inches, but about 82 per cent. of this falls in the five months of November to March inclusive. The maximum rainfall in any one month since 1906 was 13.79 inches, occurring in January, 1911. The accompanying table will afford detailed information as to the monthly distribution of rainfall during the last seven years.

RAINFALL AT SAN FRANCISCO FROM JULY, 1906, TO JUNE, 1913
From U. S. Weather Bureau Records

SEASON	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MCH.	APR.	MAY	JUNE	SEASONAL
1906-7.....	0 08	0.11	0.18	0 03	1.59	6.90	4.41	3.02	8.42	0.11	0.04	1.28	26.17
1907-8.....	T	0 02	0.11	1.36	0.04	3.66	4 88	5.39	0 90	0.22	0.76	0.01	17.35
1908-9.....	0.02	0.01	0.13	0.61	1.34	2.15	10.51	7.53	3.27	T	T	T	25 57
1909-10.....	O	T	0 80	1.23	2.43	5.59	3.24	2.09	3.78	0.31	0 03	0.02	19.52
1910-11.....	T	O	0.05	0.65	0.48	1.73	13.79	3.02	4.57	0.89	0 28	0.03	25 49
1911-12.....	T	O	T	0 28	0.60	2.54	2.47	0.41	4.10	1.38	1.47	0.81	14.06
1912-13.....	T	O	1.25	0.49	1.94	1.30	3.84	0.43	1.47	0.60	0.63	0.02	11.97
Means....	0.02	0.02	0.31	1.00	2.54	4.51	4.88	3.56	3.74	1.66	0.73	0.16	23.07

Means are for a period of 63 years, from 1849-50 to 1912-13.

The data indicating the rainfall for San Francisco undoubtedly apply, so far as the monthly distribution is concerned, to the hills where the fault trace occurs, but the amounts should be materially increased. The hills are from three hundred to four hundred feet higher than San Francisco and are also nearer to the northern ridges of the Santa Cruz Mountains. According to the

rainfall map, based on long period records and published by the Spring Valley Water Company,[3] the isohyetal line of forty inches passes through the fault zone area. This would indicate not only a seasonal rainfall of forty inches instead of twenty-three inches but also that the heaviest rainfall in a single month may have reached twenty-five inches. Remembering that in this climate four-fifths of the rainfall is concentrated in five winter months, the persistence of the fault trace is certainly not to be attributed to the aridity of the climate.

Agents of erosion other than water have relatively little effect in this locality. Actual freezing of the ground occurs so seldom and for such short periods of time that it must have but slight influence on the rapidity of erosion. The effect of wind erosion may also be omitted from consideration with grass-covered land receiving the amount of rainfall indicated above and also subject to the ocean fogs during much of the summer.

The original object of the writer in keeping a part of the fault zone under observation during the last seven years was not for the purpose of determining the persistence of the fault trace. Instead, the observation was undertaken with the idea that erosion might have played quite a part in the development of the small depressions or sags characteristic of the fault zone as it was prior to the movement of 1906. Writers on the San Andreas Fault have quite generally attributed these small depressions to the dropping of minor fault-blocks or wedges along the fault zone, thus classifying them genetically with larger valleys of the *graben* type.

There is certainly a possibility that in the horizontal movement of the two sides of the fault plane, concave surfaces would in some instances be left opposite each other, leaving a vacant space of some appreciable size at a relatively short distance below the surface. Under such conditions there should be a slow downwashing of fragmental material and of soil which would leave a sink-hole at the surface. The observations thus far have not been conclusive. In two or three places slight sinking took place, but these localities have since been plowed, which may possibly interfere with further development. Surface wash in cultivated land will probably fill in a developing sink as rapidly as the depression would grow by underground settling, unless in the extreme instances of the formation of an open channel connecting the bottom of the depression with the cavity below.

[3] Future Water Supply of San Francisco. San Francisco, 1912.

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The slowness of surface erosion as indicated by these observations suggests that the theory of the development of "fault-sags" by erosion subsequent to the faulting may yet be found correct in some instances. Sufficient underground water may seldom be present to facilitate such action. The heaviest rainfall for a single month recorded at San Francisco is 24.36 inches. As this indicates a possibility of forty inches in a single month with the heavier rainfall of the fault zone, the greatest rapidity of erosion and the best opportunity for the development of an erosional fault-sag may not have occurred as yet. Any conclusion as to the erosional origin of fault-sags along the rift will have to be deferred until the observations have been carried on for a much longer period and until several years of excessive rainfall have occurred.

ABSTRACTS OF PAPERS READ AT THE JOINT MEETING OF THE A. G. S. AND THE A. A. G. IN NEW YORK, APRIL 3 AND 4, 1914

THE PLATFORMS OF BARRIER CORAL REEFS. By THOMAS WAYLAND VAUGHAN

There are three kinds of coral reefs, *viz.:*

1. Fringing or shore reefs which occur along the strand line.

2. Barrier reefs which occur at variable distances off shore and have lagoons from one or two to as much as thirty or even forty fathoms in depth between them and the strand line.

3. Atolls, which are ring-like and inclose lagoons above whose surface no land masses of importance protrude.

As the relations of barrier reefs and atolls to the platforms on which they stand constitute, in the opinion of geologists, the essential part of the theory of the development of Recent reefs, the warfare of coral reef theory has been waged over the interpretation of these relations, which are the conditions of changing or changed position of the strand line and the part played by reef-forming organisms as constructional agents. The special object of the paper was to point out the relations of barrier coral reefs to the last dominant change in the position of the strand line and to indicate the part the organisms forming Recent barrier reefs have played in building the reef platforms.

The introductory remarks were followed by a résumé of the principal hypotheses and theories advanced in explanation of barrier reefs and atolls. Those of Darwin, Dana, Semper, Murray, Admiral Sir W. J. L. Wharton, Alexander Agassiz, C. E. Andrews, Stanley Gardiner, Hedley and Griffith Taylor, Daly, and Wood-Jones were briefly reviewed. It was pointed out that, according to Darwin and Dana, barrier reefs and atolls margin platforms built during subsidence by agencies dependent upon the presence of reefs, while the other hypotheses advance different explanations.

The criteria for determining the direction and amount of change in position of strand line, whether by positive or negative movement, were briefly enumerated. With regard to criteria for estimating the constructional work of reef-forming organisms is was said that if corals and the associated organisms, which form the material composing what are designated coral reefs, have built the platform, the geographic limits of the reef platform and the reef-forming organisms should be coincident; and that, if the platform owes its origin to agencies other than those of reef-forming organisms—the reefs being merely superimposed upon it—its extent should be beyond the limits of such organisms and independent of their presence.

The recent literature in which physiographic criteria have been applied to the eludication of the coral reef problem was briefly reviewed. Attention was especially directed to the work of Alexander Agassiz, Verrill, and others in the Bermudas; Alexander Agassiz and others in the Bahamas; Hayes, Vaughan, and Spencer in Cuba; Branner in Brazil; Sanford, Matson, and Vaughan in Florida; C. E. Andrews, Hedley and Griffith Taylor, and T. W. Edgeworth David in Australia; Wood-Jones in the Cocos-Keeling group; P. Marshall in the Society and Cook islands; and C. Elschner in Nauru and the Paumotus. The enumeration showed that both American and Australasian geologists, each group working in the region in which it was located, have been persistently applying physiographic criteria to the study of the coral reef problem for the past thirteen or fourteen years.

The results of the author's recent expedition to several smaller West Indian islands, largely for the purpose of studying the changes in strand line antecedent to the development of the living barrier reefs, were presented. It was shown that the shore line of Antigua is deeply indented by numerous bays and harbors, as St. Johns, Five Islands, and Falmouth harbors, and Willoughby, Nonsuch, and Belfast bays. The absence of terraces and elevated wave-cut cliffs was mentioned, and it was stated that in St. Johns Harbor at a depth of about twenty feet below sea level a four-foot bed of peat, which according to Mr. C. A. Davis is not composed of marine plants, adds confirmation to the inference that the last important movement of sea level was positive. Stable conditions for some time is shown by the alluvial fillings at the heads of reentrants and along streamways, and by high wave-cut cliffs. The island of Barbuda, which occupies the northern part of the shallow plateau on the southern part of which is Antigua, is separated from the latter island by water eighteen fathoms or less in depth. In Barbuda fresh-water springs which emerge below sea level have been observed by Mr. H. A. Tempany, and the similarity of the land mollusca of Antigua and Barbuda supports the inference that these islands were part of one land mass in Pleistocene time and have been severed by positive movement of sea level. Barrier reefs occur as disconnected banks on the platform near both Antigua and Barbuda. It is evident that this platform has been submerged and that its existence is independent of the reefs which grow upon it in certain favorable localities.

The islands St. Bartholomew, St. Martin and Anguilla, which rise above the surface of the St. Martin Plateau, are separated by water ranging from fourteen to sixteen fathoms in depth, while there is an increase in declivity near the edge of the platform at depths between thirty and forty fathoms. That the last important change of sea level was by positive movement is evident from the indented character of the shore line in St. Bartholomew, St. Martin and Anguilla; and in Anguilla additional evidence is afforded by the

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underground communication between the sea and inclosed basins in the limestone. Stable condition of the shore line for a considerable period is attested by wave-cut cliffs, the development of the beaches, and the alluvial fillings at the heads of reentrants in the land mass, and, in St. Martin, by the presence of unterraced flood plains along the streamways. Barrier reefs occur in places off these three islands but are disconnected and occupy a very small proportion of the surface of the platform. It is evident that these reefs are merely superimposed on an antecedent platform brought into its present relation to sea level by submergence.

The well-developed barrier reefs off both the north and south coasts of St. Croix Island occupy portions of the surface of a platform which, as shown by the indented, ragged coastline and the depth of water on the platform, has been submerged. The platform above the surface of which the Virgin Islands rise, the nature of their coast line, and the coral reefs of the Virgin Bank, were briefly described. The maximum depth of water between the islands is about seventeen fathoms. The coastal phenomena, such as reentrants into the land mass, alluvial fillings at their heads, unterraced alluvial bottoms along streamways, and wave-cut cliffs on the unterraced promontories, were mentioned, especially for the island of St. Thomas, which was personally examined by the author. The conditions under which the coral reefs of the Virgin Bank and eastern Porto Rico have been developed are clear, that is, they also are superimposed on a depressed platform, a very small portion of the surface of which is covered by them.

These relations were shown to be similar to those already known to prevail in Florida, Andros Island, Bahamas, and Cuba, where the living barrier reefs stand upon depressed platforms which are independent of the reefs as they are continuous irrespective of the geographic limits of the reefs.

The barrier reefs of Honduras, Nicaragua, and Brazil were next briefly described and it was shown that they conform to the conditions of development enunciated for those of Florida, Cuba, the Bahamas, the Virgin Islands, and the northern Leeward Islands, that is, all are superimposed on submerged platforms.

The principal barrier reefs of the Pacific Ocean were then considered, namely, the Great Barrier Reef of Australia, the barrier reefs of New Caledonia, and those of the Tahiti and Fiji groups. In each instance it was shown that the reefs occur on submerged platforms which are independent of the presence of the reefs and the conditions are therefore similar to those indicated for the Gulf of Mexico and Caribbean region of the Atlantic.

The remarks on the platforms of barrier coral reefs were summarized in the following words: "This examination of the principal barrier coral reefs of the world leads to accordant results as regards the relations the reef platforms bear to change of sea level and the part played by corals and associated organisms as platform builders. All the platforms have been brought below sea level by a moderate submergence, less than forty-five fathoms, and the living reefs are superimposed on these platforms where the conditions necessary for their existence obtain."

The history of many reef areas antecedent to the development of the recent reefs had been exceedingly complicated, and in much of the discussion of the problem, failure to recognize the proper sequence or the relative importance of events has led to misinterpretation. The consideration of these complexities is beyond the province of the paper.

The subject of atolls was briefly considered. The results of investigations recently conducted in Florida show that of the two rival hypotheses for the formation of atolls, whether by submarine solution or by constructional agencies, the formation by the former method, as relates to Florida, must be eliminated from consideration. This conclusion coincides with the results of Hedley and Griffith Taylor obtained on the Great Barrier Reef of Australia and those of Wood-Jones from a study of the Cocos-Keeling group. The results of the author's investigations of the effects of winds and currents in shaping atoll rims confirm the opinions already published by Hedley and Taylor and by Wood-Jones. The atoll rims of both the Marquesas and the Tortugas are constructional phenomena and owe their configuration to the prevailing winds and currents. The atolls along the line of the Great Barrier Reef of Australia and those of the Florida coral reef tract rise above a comparatively shallow platform. The atolls that encircle in various degrees the edges of the flat summits of mountains rising from oceanic depths must be attributed to somewhat different causes, although the effect of winds and currents in shaping such atolls must be admitted. The greater restriction of the reef-forming organisms to the outer margin of the flat summits is mostly if not solely due to the intolerance of reef-forming organisms to sediment.

It was then stated that Admiral Sir W. J. L. Wharton had clearly pointed out the incompleteness of atoll rims by his words "the low rim of growing coral which encircles their edges in various degrees." Daly's compilation of the depths of atoll lagoons is most significant, as it shows accordance in depth with the lagoon channels within barrier reefs. Great crustal subsidence for atoll areas is not indicated by the facts at present available; the evidence, however, does indicate a Recent increase in the depth of water in barrier reef and atoll areas by an amount of twenty fathoms or somewhat more but not so great as fifty fathoms.

The author did not attempt to explain the processes whereby the platforms on which the reefs stand are formed. He merely showed that they are older than the Recent reefs, that they have been brought into their present relation to sea level by submergence, and that the reefs are superimposed on them. The problem of the formation of these platforms, although one of great geologic importance, is aside from the immediate object of the paper.

Mr. J. E. Spurr has supplied the following note bearing upon the results of Mr. Vaughan's work:

"The following observations which were made on the stream mouths along the east coast of Nicaragua are presented, as bearing on the recent discussions of the relation of coral reefs to coastal submergence:

"The writer has recently visited repeatedly the east coast of Nicaragua from Cape Gracias á Dios to Bluefields, and has had occasion to observe a large part of the valley of two of the major streams which empty along this coast: the Wonks, or Wonki, or Coco River, and the Prinzapolca River. He also visited, several times, the lower portion of a third important river, the Escondido, which empties at Bluefields. The lower portions of all these streams have unmistakably, it seems to the writer, the usual characteristics of submerged river channels indicating relatively recent uniform and slight submergence of the coast line. This accords with the explanation deduced by Vaughan as to the locus of the coral reefs which occur in a belt adjacent to this coast,—an explanation which, I understand, has been arrived at by a study of similar areas and by deduction from conditions shown in existing charts."

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OTHER ABSTRACTS *

Over the San Juan Mountains to the Mesa Verde. By Wallace W. Atwood. The dissection of a great volcanic plateau in the southwestern portion of Colorado has resulted in the development of a group of magnificent scenic features, the present San Juan Mountains. This work of land sculpture has continued through at least three cycles of erosion and has advanced into a fourth cycle. During that time there have been at least three epochs of mountain glaciation in the region. A record of a still earlier glacial period preceding the development of the great plateau has also been recently found at the northwest base of the range. In the plateau and mesa country bordering the mountains the record of erosion is remarkably well preserved and the surfaces of many of the mesas are mantled with débris washed from the mountains during the various cycles of erosion.

To the southwest of the range is Mesa Verde, where there is a remarkable group of ancient cliff dwellings. The life of the ancient cliff dwellers appears to have been largely controlled by the physiographic conditions which obtained in that region during the time that the dwellings were occupied.

In the Forest of Sunburst: A Study in Anthropogeography. By Collier Cobb. Seventy-six per cent. of western North Carolina is still under forest cover, or a little more than 3,000,000 acres of forest land is found in the sixteen mountain counties. The Forest of Sunburst lies in the densest portion of this forest area, occupying the slopes of Pisgah Range and the High Balsams and the valleys and coves included between them, thus covering the whole of the upper portion of the basin of Pigeon River and its tributaries. The mountains of North Carolina are the oldest forest land on the continent, and the botanists and plant geographers are agreed that the deciduous forests of eastern North America have been derived from that forest which reaches its greatest development in this mountainous region of western North Carolina.

While the hardwoods of the northern United States have migrated from the mountains since the last glacial period it seems equally certain that the coniferous growth on the Balsams and other high mountains was forced south at the time of the greatest extension of the ice sheet, and is able to survive now only in the cooler atmosphere of our high mountains.

The mean annual temperature in these mountains is 48°, and in the valleys they enclose, 54° Fahr.; while the rainfall of the region, most of which comes in the growing season, is 70 inches, being greater than that for any other portion of the United States except the Puget Sound Region.

This forest region was but sparsely inhabited a century and a half ago though a few bold men of the better class had moved from the lowlands into the mountains. None of the "poor whites" ventured across the Blue Ridge, and the term "mountain whites" applied to these highlanders, in distinction from the so-called "poor whites," is wholly misleading since the mountaineers were never of this class.

The first frontiersmen in this forest region were from those Swiss and German Palatines who began flocking into Pennsylvania late in the seventeenth

* These are shorter abstracts, supplied by the authors of papers read at the same meeting. Professor F. J. Turner's abstract of "Geographical Influences in American Political History," Mr. Oliver L. Fassig's abstract of "The Period of Safe Plant Growth in Maryland and Delaware," and Dr. L. A. Bauer's lecture on "The General Magnetic Survey of the Earth" will appear in the *Bulletin* later.

century. They settled originally "to the westward of the Quakers in the fertile limestone belts at the foot of the Blue Ridge and the Alleghanies. Here they formed the Quakers' buffer against the Indians, and, for some time, theirs were the westernmost settlements of British subjects in America. These Germans were of the Reformed or Lutheran faith. They were strongly democratic in a social sense, and detested slavery. They were model farmers and many of them were skilled workmen at trades."

These were later followed by Scotch-Irish who came from Ulster County, Ireland, when their leases from James I. had expired, and they were persecuted and evicted. Froude tells us that, "In the two years that followed the Antrim evictions, 30,000 Protestants left Ulster for a land where there was no legal robbery, and where those who sowed the seed could reap the harvest."

These people settled on the frontier of the British colonies in America, all the way from central Massachusetts to the Valley of Virginia, being in Pennsylvania just beyond the German settlements. Immediately they began fighting Indians, and gradually extended their conquests down into the piedmont and mountain regions of the South. From Lancaster, York, and Berks County, Pa., came the ancestors of the men who have counted for most in this section, from Daniel Boone and David Crockett to John C. Calhoun and William A. Graham, to Zeb Vance and Peter C. Pritchard. The mountaineers are of this same blood to-day, with not one whit of admixture from any other source; and they have preserved in these forests the manners and customs of their Teutonic and Scottish ancestors, and their speech is the good idiomatic English of the Scottish borderland, with nothing approaching a dialect. They are merely our contemporary ancestors lacking our present-day outlook; and needing not missionaries, but economic opportunity. Their speech is in no sense Elizabethan, as some have reported, for I have heard in Pennsylvania within the last thirty years, every form of expression with which I am familiar in western North Carolina, and some of them occur to-day around Worcester, Mass.

The illustrations [lantern slides] show the people at their daily tasks in the Forest of Sunburst, where I have known them since 1872 and taught them in 1881-2-3, and have been with them a month or more every summer since that time. There has always been a marked absence of blood feuds among them. No people in the world are quicker to lay hold on opportunity; and what they can do for themselves in this and the adjoining Pisgah Forest is well shown by their advancements under improving conditions. The stimulus given to the arts and crafts of the mountains by the coming of the tourist to this region is showing itself in the revival and great extension of their ancient home industries; and some of the most skilled carvers came out of these forests.

Land Sculpturing Processes in Arid Lands, with Observations from Northeastern Africa. By William Herbert Hobbs. The introduction to this paper consisted of a review of the ideas which have been held by geologists to account for the origin of the great basin-like depressions of the arid lands, and the evolution of the doctrine of deflation with emphasis upon the work of Walther, Passarge and the geologists of the Egyptian Survey. The original contribution of the paper related to the origin of the basins which lie within the great Libyan hamada to the west of the Nile Valley, the so-called "oases" of the Libyan Desert. Briefly stated, the evidence that these depressions have origin-

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ated largely through the process of deflation, consists in the general evenness and horizontality of the hamada, the local nature of the disturbances in association with the depressions, the fierce duststorms and sandstorms of the region, the essential uniformity in direction of the strong winds and the trains of dunes trailing off far to leeward of the depressions, the steep northern and the graded southern descents into the basins, and, lastly, the deep loess soils (cotton soils) of the Sudan to leeward of the depressions where the equatorial rains have caught and held the migrating dust. The peculiarly simple conditions which are encountered are further explained by the fact that the hard capping of limestone in the hamada is immediately underlain by soft shaly deposits, and this has given rise to the belief that the local displacements have fixed the position of existing depressions through permitting this protective cover to be locally attacked by the drifting sands and undermined. Evidence that the effective range of action of drifting sand extends but a few feet above the surface of the ground was presented both for the region especially treated and for other arid districts.

Botanical Phenomena and the Problem of Coastal Subsidence. By Douglas W. Johnson. Students of shoreline physiography must devote much attention to such botanical phenomena as furnish evidence of recent changes in the horizontal or vertical position of the coast. The kinds of plants and plant remains in the marshes, the distribution of plants on the beaches, and the physical condition of plants at the immediate shoreline give reliable indications of recent shoreline changes. Unfortunately, this botanical evidence has been widely misinterpreted to indicate a progressive subsidence of the land. The paper supports the thesis that the botanical phenomena prove horizontal and vertical fluctuations of the shoreline which are not connected with any general land movement.

The Characteristics of the Mississippi Delta in the Light of some Observations on Old World Deltas. By E. W. Shaw. Certain phenomena, particularly irregular subsidence on land and the upheavals off shore known as mud lumps, suggest that the Mississippi delta is affected by internal flowage. In the hope of obtaining important side light on this and other problems, a brief examination has recently been made of many large and small deltas of Europe, Northern Africa, and Western Asia. The progress made in understanding the Mississippi delta was, however, through the observation of dissimilar, rather than similar characters, for each delta seems to be built on individual specifications. The Mississippi delta appears to be unique in the rapidity of its growth, in the fineness and arrangement of the materials composing it, and in other characters which seem related to these, such as the extreme development of the bird foot form, the narrowness, depth, and stability of its stream channels, and, most interesting of all, a condition of unstable equilibrium.

The stability of a delta appears to depend principally on (1) its thickness, (2) the slope of its front, (3) the proportion of sand in the river's sediment, (4) the extent to which this sediment is washed by the sea or lake, (5) the rate of growth, and (6) the degree to which extremely fine watery sediment is separated into layers of wide extent. In the Mississippi delta all these factors seem to favor instability. The thickness is thousands of feet. The front, though not steeper than that of many sand deltas, is very steep for a mud delta, and might be steeper were it not for flowage. The river delivers to the

sea relatively little sand, and most of that is brought at times of high water. The sea does not sort or carry away much of the sediment, so that the delta grows rapidly and layers of sandy silt corresponding to high stages of the river are separated by layers consisting of soft flocculated clay and other fine watery material.

The Tree as a Factor in Man's Adjustment to Hilly and Rocky Lands. By J. Russell Smith. Man's living depends upon plants, and plants upon the soil, requiring, in addition to fertility, heat, light, and moisture. American agriculture has added to these the fifth factor, tillage, which is artificial. By its topographic soil requirements, the plow becomes the limiting factor in production (other than the thin harvests supplied by forest and pasture) for a large proportion of our land that is fit in all respects for heavy plant growth. The tree crop growers of Majorca, Sicily and Corsica show us instructive methods of hill utilization whose results exceed the yields of wood producing forestry or pasture.

THE TOPOGRAPHIC MAP OF MEXICO

(Map facing p. 434.)

Mexico is one of the few Latin-American countries which is issuing a large-scale topographic map of its territory. The official title of the Mexican map is "Carta de la República Mexicana á la 100,000a" and, as the name implies, its scale is 1:100,000, or about 1.58 miles to the inch. The map is published by the Comisión Geográfico-Exploradora, which is under the joint jurisdiction of the Departments of Promotion (Fomento) and War. Two hundred sheets out of a proposed total of 1100 have been published so far (cf. footnote 3). These embrace mainly, as will be seen on the accompanying index map, the eastern part of the country (states of Nuevo Leon, Tamaulipas, San Luis Potosí, Vera Cruz, Puebla, Tlaxcala, part of Mexico, and the Distrito Federal) and certain sections in the north (central Sonora and northern Chihuahua).

The map is subdivided according to the rectangular system, *i. e.* each sheet is a rectangle whose sides do not coincide with parallels and meridians, the projection having been laid out for the whole map as a unit. The whole map is conceived to be divided into nine sheets on the scale of 1:2,000,000, numbered from 1 to 9 (heavy Arabic numerals in block lettering on the accompanying index map); each of these in turn into four sheets on the scale of 1:1,000,000, numbered consecutively from 1 to 24 in so far as they cover Mexican territory (smaller Arabic numerals in Roman lettering); each of these again into four sheets on the scale of 1:500,000, numbered from I to IV (Roman numerals); and, finally, each of these into twenty-five sheets on the scale of 1:100,000, designated by letter as shown on the diagram in the upper right hand corner of the index map. Except for those on the scale of 1:100,000, no sheets have been published, as such, of any of these series, as far as it has been possible to ascertain, although the scales of 1:500,000 and 1:2,000,000 are represented in other official maps, as referred to below. The published sheets on the scale of 1:100,000 are designated according to their position within the two next higher units of subdivision. Thus, the sheets containing Tampico and Vera Cruz are designated respectively 14–I–(Z) and 19–II–(S).

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The area represented on each sheet measures 53 by 40 centimeters (20⅞ by 15¾ inches). Relief is represented by unnumbered contours in dark brown with a vertical interval of 50 meters (164 ft.), the elevation, in meters, of critical points being occasionally given in numerals in blue. Drainage and hydrography are in light blue, distinction in color being made, however, between perennial watercourses and dry river beds, the latter being shown by broken lines in brown. Towns, villages, ranches and single buildings are indicated by various symbols in red. Roads and trails are shown in yellow brown, distinction being made between four kinds. Railroads are shown in black, different symbols being used for standard and narrow gauge. Boundaries are also shown in black. All these symbols are explained in detail on a key sheet entitled "Reglamento de signos y caracteres." Every fifth meridian and parallel is drawn out and graduations for every minute are given on the border of the map. Longitude is reckoned from the eastern tower of the Cathedral in Mexico City (99°8′ 0.87″ W. of Greenwich). At the four corners of each sheet are given the designations of the adjoining sheets so far as published. On the lower margin of each sheet are printed: a list of all points on it and on adjoining sheets whose geographic coordinates have been determined; a diagram on the scale of 1:500,000 showing, in colored symbols corresponding to an adjoining list, by whom the various routes were traversed and the extent of previous surveys, if any; the names of the compilers and draftsmen of the sheet; the magnetic declination; and the date of publication. The sheets are printed from zinc plates.

While not based on surveys carried out according to the most refined methods the map fulfills its purpose very satisfactorily. At the beginning of its work the Comisión very wisely decided not to undertake a general triangulation in view of the extent of the country and the limited means at its disposal. Instead, a network is being established of points whose positions are determined astronomically—latitude by circummeridian altitudes, longitude by telegraph or, if not possible otherwise, by chronometer—leaving the intervening areas to be filled in by route traverses with compass and perambulator. Elevations are determined by barometer, the readings being made simultaneously with those of the central meteorological observatory at Mexico City or of temporary stations locally established for the purpose. The maximum errors have been found to be comparatively small: for latitude, half a second of an arc; for longitude, one-tenth of a second of time by telegraph and three-tenths by chronometer; for elevation, 15 meters.[1] Although the map is thus, strictly speaking, only a reconnaissance map, it is very accurate for its class.

[1] This and other information about the work and organization of the Comisión will be found in the pamphlets issued by it on the occasion of the various expositions to which it sent exhibits, *e. g.* the International Geographical Congress in London, 1895, the International Exposition at Paris, 1900, and the Pan-American Exposition at Buffalo, 1901. These are entitled respectively:

(1) Geographical and Exploring Commission of the Mexican Republic: Catalogue of the Exhibits Presented by the Commission, with a Short Sketch of its Organization and Labors, by the Directing Engineer, Julio Alvarado, C.E. Dept. of Fomento, Colonization and Industry, Mexico, 1895. 67 pp. [In English and Spanish].

(2) Comisión Geográfico-Exploradora de la República Mexicana: Catálogo de los objetos que componen el contingente de la expresada Comisión, precedido de una reseña abreviada sobre su organización y trabajos. por el ingeniero Director Julio Alvarado. Oficina Tip. de la Secretaria de Fomento, México. 1900. 46 pp.

(3) The Geographical and Exploring Commission of the Mexican Republic: Sketch of Its Organization and Labors (title on cover: Some Facts regarding the Geographical and Exploring Commission of the United States of Mexico). By the Directing Engineer, Julio Alvarado, C.E. Printed by Gies & Co., Buffalo, N. Y., no date. 23 pp.

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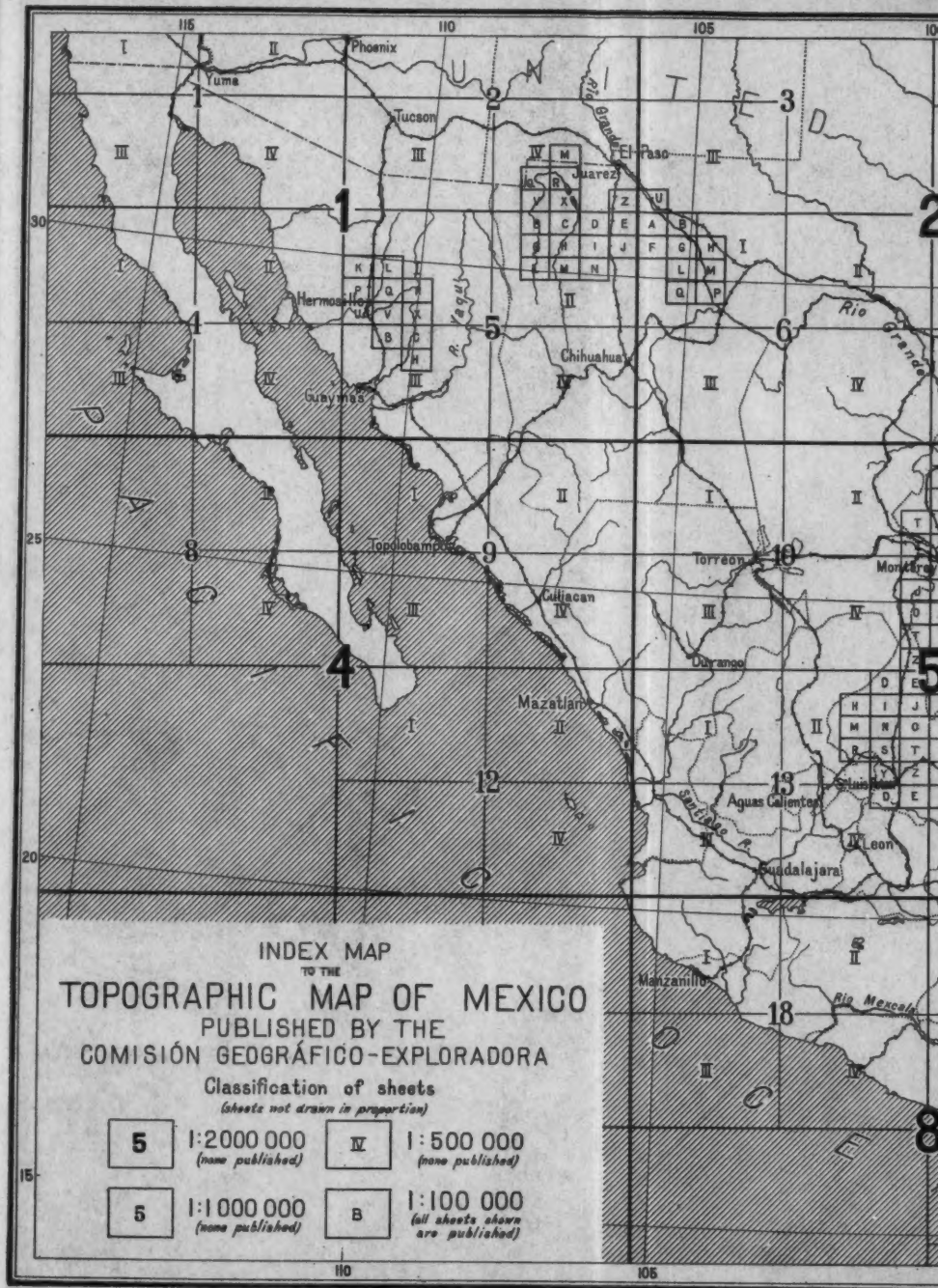
INDEX MAP
TO THE
TOPOGRAPHIC MAP OF MEXICO
PUBLISHED BY THE
COMISIÓN GEOGRÁFICO-EXPLORADORA
Classification of sheets
(sheets not drawn in proportion)
5 1:2000 000 (none published)
IV 1:500 000 (none published)
5 1:1000 000 (none published)
B 1:100 000 (all sheets shown are published)
UNITED
MEXICO
PACIFIC OCEAN
Phoenix
Yuma
Tucson
El Paso
Juarez
Hermosillo
Guaymas
Chihuahua
Rio Grande
Topolobampo
Culiacan
Torreon
Durango
Mazatlan
Aguas Calientes
Leon
Guadalajara
Manzanillo
Rio Mezcala
110
105
30
25
20
15

1 : 11 250 0

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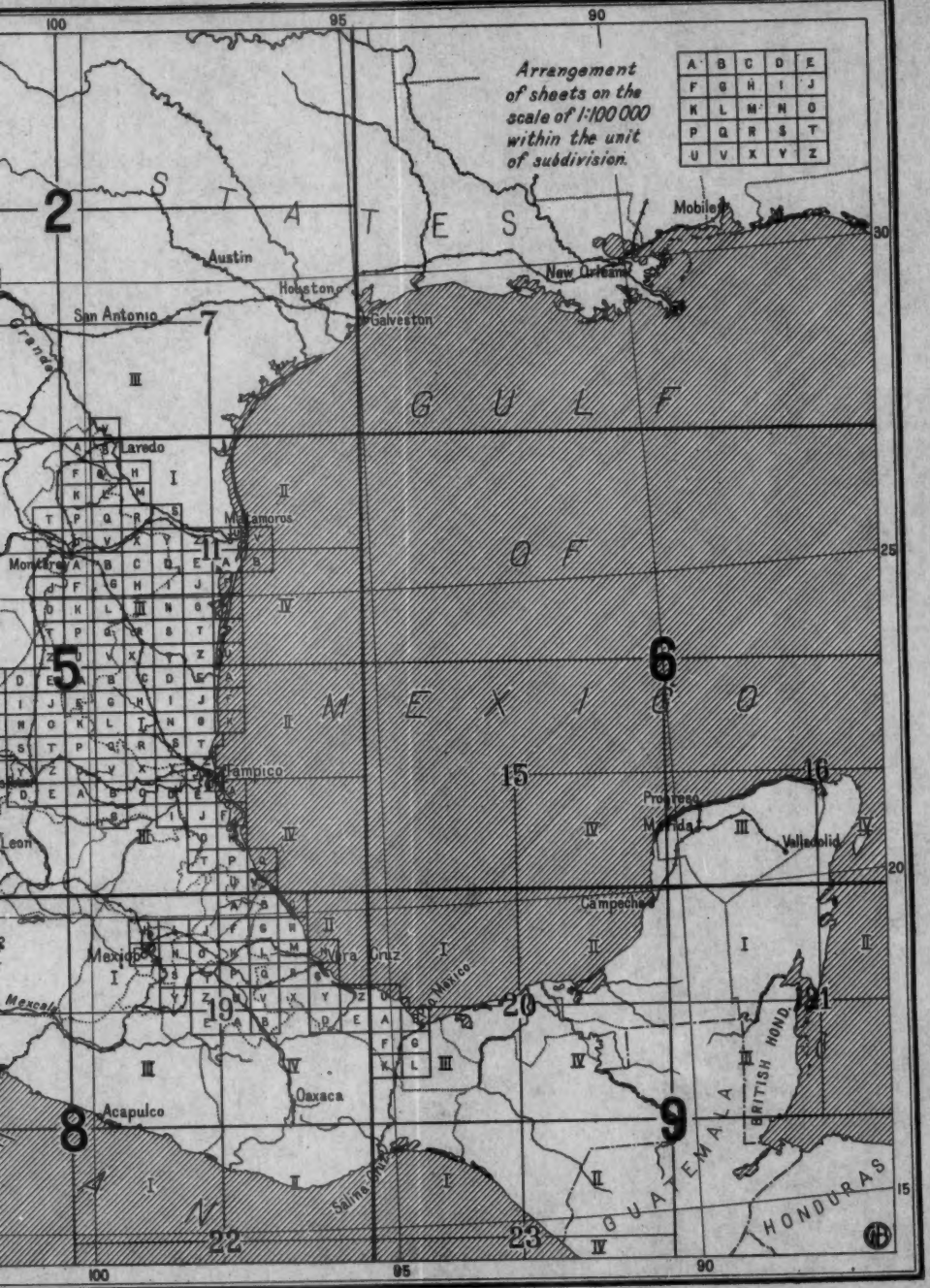
Arrangement of sheets on the scale of 1:100 000 within the unit of subdivision.
A B C D E
F G H I J
K L M N O
P Q R S T
U V X Y Z
100
95
90
30
25
20
15
2
5
6
7
8
9
11
15
16
19
20
21
22
23
STATES
GULF OF MEXICO
Austin
Houston
San Antonio
Galveston
Mobile
New Orleans
Laredo
Matamoros
Monterrey
Tampico
Progreso
Merida
Valladolid
Campeche
Leon
Mexico
Vera Cruz
Rio Panuco
Oaxaca
Acapulco
Salina Cruz
GUATEMALA
BRITISH HOND.
HONDURAS
Rio Grande
Mexcala

1 250 000

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As previously stated, no other than the 1:100,000 sheets have been published, so far as known, of the contemplated four series of maps. With these sheets as a basis, however, maps have been prepared of certain states as units, some of which, in scale, coincide with the contemplated 1:500,000 series. These maps are published by the various states themselves, at whose instance they were prepared, although the compilation and engraving was done by the Comisión. As far as known these include the following: Nuevo Leon, 1:500,000, published in 1901 (relief in shading); Tamaulipas, 1:500,000; San Luis Potosí, 1:250,000, published in 1895 (relief in shading);[2] Vera Cruz, 1:250,000; Tlaxcala, 1:100,000, published in 1908 (relief in contours); Morelos, 1:100,000, published in 1910 (relief in contours). These last two maps consist simply of the assembled relevant portions of the 1:100,000 sheets. Surveys are in progress in the states of Hidalgo and Oaxaca which will result in the publication of maps of these states on the scales of 1:200,000 and 1:250,000 respectively. Besides these state maps the Comisión has published several special maps on larger scales, *viz.:* (1) Carta Corográfica del Distrito Federal construida en la Secretaría de Fomento por disposición del Secretario del Ramo, Ingeniero Manuel Fernández Leal, 1:50,000, published in 1899 (relief in hachures); (2) Atlas Topográfico de los Alrededores de Puebla, 1:20,000, in 9 sheets (relief in contours; a reduction with relief in hachures has also been published on the scale of 1:50,000); (3) Carta Topográfica de los Alrededores de Xalapa, 1:20,000 (two editions; relief in contours and in hachures; in manuscript only?). Finally the Comisión has published a general map of Mexico on the scale of 1:2,000,000 entitled "Carta General de la República Mexicana formada en la Secretaría de Fomento por disposición del Secretario del Ramo, Lic. Olegario Molina, 1910," whose scale might indicate some relation to the proposed sheet map on the same scale, although it is drawn and published as a unit. Relief is in red-brown shading, drainage in blue, towns whose positions have been astronomically determined, in red, others in black, roads in yellow brown and railroads in black.

The data here given are based partly on the maps themselves, partly on the pamphlets mentioned in footnotes 1 and 2 and partly on information kindly placed at the Society's disposal last year by the Director of the Comisión, Brig.-Gen. José Gonzalez Moreno, whose unfailing courtesy in answering inquiries it is a pleasure herewith to acknowledge. To him the Society is indebted for the gift of a valuable index map on the scale of 1:2,000,000 showing in hand coloring the sheets published of the 1:100,000 topographic map, on which the accompanying diagram is based[3]; also of the map of the environs of Pueblo and of the pamphlets previously mentioned. The Secretary of the Department of Promotion (Fomento) kindly presented a complete set of the 1:100,000 topo-

[2] *Cf.* Memoria presentada al gobierno del estado por el jefe de la Comisión Geográfico Exploradora, Coronel Julio Alvarado, relativa a los trabajos ejecutados para el levantamiento de la carta geográfica del estado de San Luis Potosí. 19 pp. San Luis Potosí, Tip. Escuela Industrial Militar, 1895.

[3] On the official index map, sheets 14-II-(P), 14-II-(U) and 20-I-(V) are indicated as having been published individually. Inasmuch as the small land area which each embraces is shown on the respective adjoining sheets 14-I-(T), 14-I-(Z) and 20-I-(U) and as these three sheets were not included in the complete set sent to the Society, it was assumed that they have not been published as such, and the accompanying diagram has been drawn accordingly. The proportion of published to proposed sheets given in the first paragraph above, however, includes all the sheets indicated on the official index map.

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graphic sheets as well as the general map of Mexico, the map of the Distrito Federal and the maps of Tlaxcala and Morelos; and the governments of Nuevo León and Pueblo sent the maps of their respective states. The 1:100,000 topographic sheets and all the other maps mentioned in this notice, with the exception of the state maps of Vera Cruz, Tamaulipas and San Luis Potosí and the map of the environs of Xalapa, may be consulted at the Society's building.

THE REVOLUTION AND THE MEXICAN PLATEAU

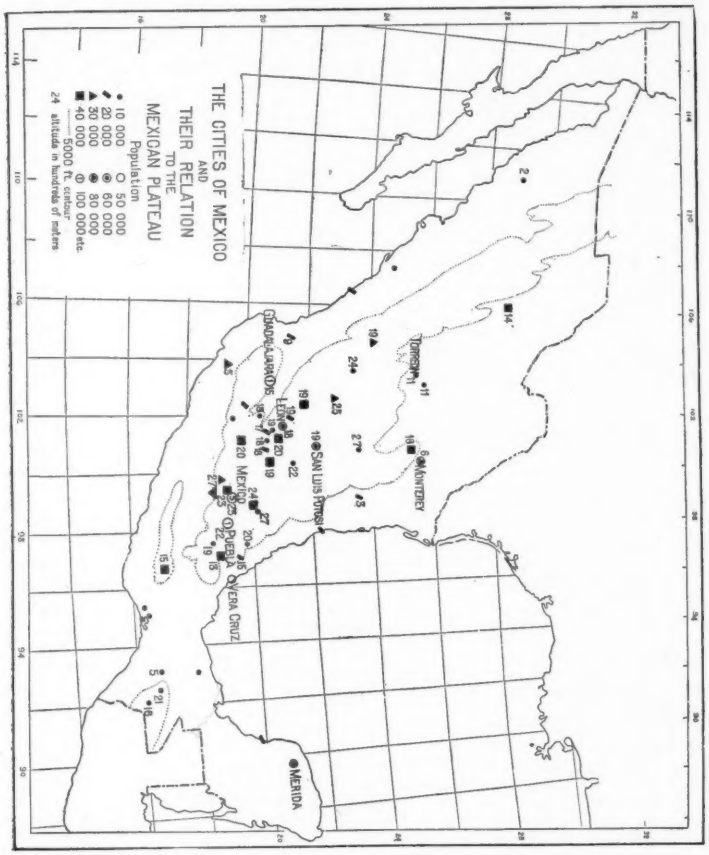
It is not generally realized that the revolutionary area in Mexico is far from the homes of the mass of the Mexican people and above all far below the level at which they live. It is a curiously "upstairs" country. Much the greater part of the people live on a plateau more than five thousand feet above the sea. This plateau area is outlined on the accompanying map with a dotted line. Its association with Mexican life is shown by putting on the map all the towns upwards of ten thousand people in 1910. It is evident at a glance that they are massed especially on the plateau. The population of the towns is roughly shown by the marks that represent them on the map, dots for ten thousand, bars for twenty, triangles for thirty, squares for forty and circles for fifty thousand. Sixty thousand is shown by a dot within a circle and so on, but the names are given of all towns with a population of over fifty thousand. Three cities at the high, southern end of the plateau have over a hundred thousand: Guadalajara (118,799), Mexico (470,659), and Puebla (101,214)).

The revolution has not yet got up to this plateau, holding only the northern country as far south as Torreon and some of the low country about Tampico in the east and south of the plateau border between Mexico and Guadalajara. The only cities of any size that the rebels hold as yet (May 7) are Chihuahua (39,061) and Monterey (81,006). Chihuahua is in the north, just off the plateau border and too far away from the Federal base for the Federals to hold, so they abandoned it. Monterey is also off the plateau, at only 2,000 ft., by far the largest city at so low a level. Seltillo (35,063), near it, is on the plateau, but this the rebels have gone by for the fighting near San Luis Potosí. Torreon is a small place. The population has not yet been reported for 1910, but ten years ago it was 13,800. The *area* held by the rebels is very large, perhaps a third of Mexican territory, but a great deal of it is uninhabited, with certainly less than one and a half of Mexico's fifteen million people, a bare tenth of the population. The task of the rebels is thus still mainly ahead of them.

The cities of forty thousand (the squares on the map), are, from north to south: Chihuahua (39,061), Saltillo (35,063), Aguas Calientes (44,800), Guanajuato (35,147), Querétaro (35,011), Pachuca (38,620); then, west of Mexico City, Morelia (39,160), close to the capital, Tacubaya (35,830), and, toward Vera Cruz, Orizaba (36,189). Oaxaca (37,469) stands isolated on a five thousand foot upland of its own farther south. The cities of thirty thousand (triangles) are: on the plateau southwest of Torreon, Durango (34,085);

southeast of it, Zacatecas (25,905); near the capital, Toluca (31,247); and on lower ground nearer the west coast, Colima (25,148).

Close beside each city symbol is a little number giving its elevation in hundreds of meters. These figures show that the larger cities are on higher ground near the southern end of the plateau about Mexico City, at elevations



of seven or eight thousand feet. The heart of Mexico is now as always most vulnerable from Vera Cruz, on account of the nearness of the thickly settled regions to the sea in that neighborhood, though the ascent is steepest there and the low ground to be passed through most unwholesome. MARK JEFFERSON.

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GEOGRAPHICAL RECORD

THE AMERICAN GEOGRAPHICAL SOCIETY

Regular Meeting of the Society. A regular meeting of the Society was held at the Engineering Societies' Building, No. 29 West 39th Street, on Tuesday evening, April 21, 1914; Councillor Chandler Robbins in the Chair. The following persons, recommended by the Council, were elected to Fellowship:

Sidney Powers, Cambridge, Mass.,
J. T. Edwards, Toronto,
Joseph T. Mulligan, New York City,
August R. Ohman, New York City.

The Hon. Dean Conant Worcester, A.B., Secretary of the Interior of the Philippine Islands, 1901-1913, then addressed the Society on "The Philippines: Our Far-Pacific Outpost." Mr. Worcester very graphically contrasted the Philippines as they were at the time of the American occupancy with the vastly improved conditions of to-day. His remarks were followed with great interest by an audience that filled the auditorium. The lecture was illustrated by many fine lantern views and also by a few moving pictures.

The Society's Latest Exhibition. The Society is showing in its Exhibition Hall a collection of 277 photographs of Porto Rico, 31 of Bermuda, 54 of Constantinople and 59 of notable recent maps. The number of visitors is now averaging over 1,300 a month and is increasing. The Exhibition Hall is open to the public from 10 A. M. to 5 P. M. on week days and from 2 to 5 P. M. on Sundays.

The Memorial Volume. A volume with this title, to be issued this summer by the Society, will contain twenty-six papers written chiefly by European geographers who participated in the Transcontinental Excursion of 1912. The book will be a memorial of that event. Most of the papers are of a technical nature, especially intended for the perusal of geographers; and three-fourths or more of the book will be printed in the German, French and Italian languages. As the work will be a special publication, not included in the current issues from our press, the edition will be limited. Any Fellow who desires a copy is requested to send written application for it to our office not later than June 15, prox., so that a sufficient number may be provided.

NORTH AMERICA

The Next Annual Meeting of the Association of American Geographers. The Council of the Association of American Geographers announces that the annual meeting during the holiday recess, next winter, will be held at Chicago on dates to be announced hereafter. Much interest has been aroused by the two papers on physiographic regions given at the recent meeting at Princeton. The United States Geological Survey is especially interested in the Association's work in this field. The Council has therefore decided that the question of physiographic regions and boundaries shall be the subject of discussion at the next annual round table conference. Professor N. M. Fenneman has been selected to lead the conference.

A Building for Geology and Geography. The University of Chicago is erecting a building for the Departments of Geology and Geography to be known as Julius Rosenwald Hall. The structure will be of stone, steel and cement and will be fireproof. It will cost about $260,000 exclusive of furnishings, and is expected to be completed by November 1.

The Fur-Seal Commission. The President and the Secretary of Commerce having approved the recommendation of the Commissioner of Fisheries, a commission has been appointed to visit the Pribilof Islands this season. The three members are Mr. Edward A. Preble, assistant biologist of the Bureau of

the Biological Survey; Mr. Wilfred H. Osgood, of the Field Museum of Natural History, Chicago; and Dr. George H. Parker of Harvard University. The commissioners will reach the seal islands on a revenue cutter late in June and will remain until the second week in August. They will ascertain the condition of the seal herd, study the relations and obligations of the government towards the herd, the fur trade, and the scientific and economic questions involved in the administration of the seal herd.

Surveying with an Auto Truck. Mr. C. V. Hodgson, of the Coast and Geodetic Survey, has recently left Washington to take charge of a party for the determination of the astronomic latitude of triangulation stations established by the Coast and Geodetic Survey and the United States Geological Survey, between Barstow, Tex., and the Pacific Ocean. Many of these stations are on mountains as much as 10,000 feet in height. The results of this work will be used principally for geodetic purposes, in other words, for the determination of the figure of the earth and the distribution of material in the earth's crust. The means of transportation will be an automobile truck which was used successfully on similar work between Denver and the Canadian border in 1913. Such a truck was employed also in 1912 on the forty-ninth parallel boundary survey between the United States and Canada. The cost of the work in 1913 was estimated as only half what it would have been if horses and wagons had been used for transportation. The saving, this season, will be even greater as the country to be traversed is arid or semiarid and the transportation of water and forage for stock would be a difficult problem. Work will continue until late in the autumn. In experience with the truck in 1912 it was found that a field party and its equipment could cover easily from seventy-five to one hundred miles in a day, over indifferent roads, including stops for gasoline, supplies, etc. The machine is equipped with solid rubber tires, dual behind, and with extra tanks for gasoline and water. Its weight is about 6,100 pounds and the weight of the entire outfit, including the survey party, is over four tons.

Drift Sheets in Iowa. The State Geological Survey of Iowa has recently published a map of the state showing the outlines of the Wisconsin, Iowan, Illinoisan, and Kansan drift sheets, and of the Driftless Area (Iowa Geological Survey, Vol. XXI, 1912, Plate III, 1:1,000,000.) It has been compiled from the larger scale county maps by Calvin and his associates. Excellent as this map is, it seems a pity to have lost the opportunity of presenting, on the same sheet, what is known of the distribution of striæ, something of the position of recessional moraines and outwash gravels, and an indication of the location of the heavily loess-covered parts of the state. This, in its entirety, may be at present impossible, or it may be planned for later publication. The existing map deserves commendation and will be of great help to teachers of physical geography. LAWRENCE MARTIN.

Glacial Lake Agassiz. The northern border of glacial Lake Agassiz has now been more closely defined than in the well-known monograph of Upham. The new work has been done by the Geological Survey of Canada (W. McInnes: The Basins of Nelson and Churchill Rivers, *Memoir 30*, Ottawa, 1913, pp. 125-127; map). McInnes shows that the distribution of glacial lake clays determines the outlines of the northern portion of Lake Agassiz, at whose borders the beaches are not well developed. The outline sketch map shows a greater extension than was thought by Upham to have existed, a part of the lake extending 150 miles or more northward and terminating within the drainage basin of the Churchill River. This stream, rather than the Nelson River, was probably the latest outlet of Lake Agassiz. Most of the clays, which are so thick in places as to dominate the topography, seem to have been laid down after Lake Agassiz abandoned its outlet to the south through Minnesota. LAWRENCE MARTIN.

Coal Fields of Western Canada. The Canadian Northwest at first appeared to lack one of the most necessary qualities for a great future—ade-

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quate sources of power. Its remote position with respect to eastern and central coalfields, and the 600 miles that separated it from the known deposits of British Columbia put an almost prohibitive tax on rail-transported coal. The pioneer in his prairie home required it for fuel, the threshing engines required it, and it might be the very basis of success of the Hudson Bay Railroad now in process of construction. Canadian railroads have always been heavily subsidized by the government on account of their function as pioneers in the habitable lands of southern Canada. Coal deposits near at hand would at least partially relieve both government and railroads. Under these circumstances, exploration was directed to the most promising outcrops; and the reconnaissance surveys of the government have now revealed the extent and nature of the available deposits. Their importance is shown by the fact that the coal industry has grown 500% in the last eight years. For 1913 the output is reported to be over 4,000,000 tons, about one-quarter of which was exported to other provinces of the Dominion and to the United States (*Daily Cons. and Trade Repts.*, April 11, 1914.) Coal reserves in Alberta are estimated at a much greater figure than for any other Canadian province; they are said to be 110 times that of Nova Scotia, as yet the largest producing region. The coal is mainly lignite but becomes bituminous in character on approach to the Rocky Mountain foothills. The Belly River fields occupy a large portion of southeastern Alberta. The coal is bituminous with lignite seams on the borders as at Lethbridge and Medicine Hat. A detached area of this formation occurs some 250 miles northwest of Edmonton and Dunvegan in the Peace River Valley, one of Canada's latest "boom" areas. West of the Edmonton fields is a third field most extensively developed in the ranges near the international boundary line and diminishing northward.

Coal interests have recently become deeply interested in a new anthracite deposit that yields hard and relatively smokeless coal like that in Wales and Pennsylvania. Its value is bound to be extraordinarily high not only because of its size and quality but also because of its favorable geographical position. It may easily become a distributing center for the naval bases of the Orient as well as for the new coaling stations in our Pacific ports after the opening of the Panama Canal. The probable supply is estimated at considerably over 1,000,000,000 tons, about three-quarters the amount originally computed for Pennsylvania. The deposits are located near the seaboard, comparing favorably in this respect with the Pennsylvania fields. The charter for the 150-mile railroad necessary for the exploitation of the deposits has already been secured, and a large and well-protected port site selected at Nass Bay, mouth of the Nass River. ISAIAH BOWMAN.

New Experimental Farms in Canada. The Department of Agriculture of British Columbia has selected Fort Fraser as headquarters for the system of experimental farms that will be opened this summer. At Fort Fraser, 372 miles from Prince Rupert, the new Pacific port, will be opened the principal agricultural station from which the entire system of stations will be managed. Experiments will be made in mixed farming for the guidance of settlers now moving into that part of British Columbia.

Importance of Prince George, B. C. Prince George, on the upper Fraser River, was a mere hamlet two years ago, but the building of the Grand Trunk Pacific has given it prominence. All the agricultural land for miles around is now occupied. Some time ago the town was divided into building lots. The Grand Trunk Pacific R. R. has now sold all its town lots at auction for over $2,500,000. The government of British Columbia owns one-fourth of the lots in Prince George and announces that it will sell its holdings during the coming summer. It is conceded that Prince George will become the clearing center of central British Columbia. It is situated on a flat table-land in the angle formed by the confluence of the Nechako and Fraser Rivers and is the point where the Pacific Great Eastern R. R. from Vancouver will join the Grand Trunk Pacific main line and proceed northward into the rich Peace River District.

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SOUTH AMERICA

The University of Pennsylvania Museum Expedition. A note from Mr. G. B. Gordon, Director of the University of Pennsylvania Museum, says that the expedition sent out last year to the Amazon, under the leadership of Dr. William Curtis Farabee, reached Georgetown, British Guiana, on April 20, by way of the Corentyn River from Brazil. Letters will probably be received soon giving further information of the journey and some account of the collections made. The expedition was sent to the Amazon Valley to study the aboriginal inhabitants, explore the forests where these primitive peoples live and make collections. The party left Philadelphia in March, 1913, on their steam yacht. The plans of the expedition were described in some detail in the *Bulletin* (Vol. 45, 1913, pp. 369-370). It is supposed that the expedition, having completed its work along one or more of the northeastern tributaries of the Amazon, will now return to the Amazon by sea to continue its task.

Barranquilla to be made a Seaport. Press despatches announce that the President of Colombia has signed a law providing for the opening of the bar at the mouth of the Magdalena to give sea-going vessels access to Barranquilla, the commercial metropolis of the country. At present goods and passengers bound for that place are landed at Savanilla and transported by narrow gauge railroad to Barranquilla. The new channel in the Magdalena will admit vessels drawing thirty feet of water. Piers and warehouses will be erected at Barranquilla which is the starting point for the flotilla of river steamers plying on the Magdalena River.

Agricultural Lands in Argentina. Argentina, with an area of 1,153,119 square miles, has a population of only 7,172,000. The slow progress of colonization has been attributed in part to the difficulties of obtaining land. This should be amended by the present Government policy whereby the purchase of large estates is prohibited. Of the lands best suited for tillage or grazing and set apart for colonies not more than 494 acres for agriculture or 6,178 acres for pasture may be bought by the individual purchaser; of the remaining lands not more than 49,421 acres can be leased or half this ultimately purchased (*Daily Cons. and Trade Repts.*, Nov. 20, 1913). Public lands are difficult to procure in the central provinces of Buenos Aires, Santa Fé and Córdoba but many private sales are effected, the large estates of these provinces disintegrating under pressure of increasing population.

Prices of land vary greatly, chiefly according to the controls of rainfall, water supply, soil, and proximity to the railroad. The highest values are found in the great cereal-producing region of the central provinces. In Buenos Aires, favorable lands not more than 20 miles from the railway realize from $34 to $60 per acre. Towards the northeast values rise; dairy farming lands, adjacent to Buenos Aires, reach more than double these values. Southeastern San Luis, a little more remote than the southern parts of Santa Fé and Córdoba, but enjoying similar conditions, averages $17 to $43 per acre; in the northwestern part of the same province, with less reliable water supply and farther from the railroad, $3.50 to $10. The Andean provinces of Mendoza, San Juan and La Rioja show various prices according to the highly varied physical conditions, distance from transportation lines, etc. The northern territories Chaco, Formosa and Misiones, have been little developed. The census of 1908 credits Chaco and Formosa with populations under .5 per square mile. Lands are rated from $2.50 upwards. The resources that have attracted most attention up to the present are quebracho and maté; the land, however, is also suitable for corn, rice, tobacco, cotton and sugar. The greatest advances may be expected in sugar production. Already large estates have been developed east of Salta and Jujuy in the well-watered belt along the common border of mountains and plain. The southern territories, more particularly Rio Negro, Chubut and Santa Cruz, are still undeveloped; the population of the last was under .02 per square mile in 1908. Land values average $1.25, and upwards. While these areas have been almost exclusively pastoral, La

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Pampa now shows great agricultural development and like changes will arise in Neuquen with the completion of the railroad and irrigation projects now under way. G. M. WRIGLEY.

AFRICA

Banse's Expedition to the Libyan Desert. In January last, Ewald Banse, who has long specialized in the geography of the East, left Germany for Egypt with the intention of carrying on explorations in the Libyan Desert. He had been preparing for his work in this little known region for several years and had collected all the scattered literature relating to the Libyan oases, settlements, caravan routes, mountains, etc., from which he compiled an account of exploration in the great Waste and of our present knowledge of the desert. This paper is appearing in *Petermanns Mitt.* (March, with map, and April, 1914, the final instalment to be printed in the May number), under the title of "Der gegenwärtige Stand der Erforschung der Libyschen Wüste und Tibesti."

With his little caravan consisting of five men, four camels and a donkey, Banse struck west from Alexandria along the line of the Mariut R. R. which the Egyptian government is extending westward from Alexandria, behind the coastal ridges to Dabba, 28° 26′ E. long. (see map, *Petermanns Mitt.*, 1912, No. 1, plate 25). At this point Banse expected to add two camels to his party as water carriers over the desert further west to the Siwa Oasis.

But at Dabba the explorer received a telegram from Mr. Hopman, the German Consul General at Alexandria, saying that the Egyptian authorities had informed the German diplomatic agent at Cairo that it was not regarded as desirable that Banse should visit Siwa or any of the other oases. The explorer was thus compelled to give up his projected enterprise for the present.

He, however, pushed southward into the desert traveling for eight days without meeting anyone, the first two days through steppe and six days through desert where no sign of vegetation appeared. On the seventh day he reached ranges and depressions across his path that made progress difficult and on the eighth day he came upon a very steep mountain wall about 700 feet high, not shown on maps, from which spread out deep and winding dry valleys giving much the impression of the Colorado Canyon region, with slopes so steep that the camels could not descend into them.

He visited Cairo on his return, and writing from Tripoli (March 14, 1914) he said he hoped by next winter, through diplomatic agencies, to make arrangements for carrying out his proposed work in the Libyan Desert.

The Journal of Egyptian Archæology. The first number of a new journal of this title was published by the Egyptian Exploration Fund, London, in January. It will appear quarterly in January, April, July and October, and will deal systematically with all branches of Egyptological studies. The first number contains papers by D. G. Hogarth, A. H. Sayce, W. M. Flinders Petrie, H. G. Lyons and others. The publication is a small quarto, finely printed and illustrated. The subscription price is 21 shillings per annum.

AUSTRALASIA AND OCEANIA

Carl Lumholtz's New Guinea Expedition. A letter from this well-known explorer to Councillor James B. Ford, from the northeastern part of Dutch Borneo, dated February 24, 1914, says that his headquarters at that time were at Tandjong Selor, about 3° N. lat. at the head of the delta of the large Kayan or Boeloengan River. He was spending a few months in Borneo to enlist Dyaks as carriers for his New Guinea enterprise and also to devote some time there to ethnological researches. He had just spent seven weeks in the jungle, west of Tandjong Selor, and had reached an elevation of 2,600 feet among the hills. Jungle covers the entire country including the mountain tops, which must be cleared if observations are made. He had found no particular difficulty in procuring Dyaks for his New Guinea work. They will not serve for less than a guilder (about forty cents) a day and they must also be provided with clothing for high altitude, and with food, mainly rice, dried fish and dried meat. To this outlay was to be added the cost of their trans-

portation to New Guinea and as the explorer's resources amount to only about $9,000 he will be compelled to economize closely. He had, however, a complete and excellent outfit. His Dyaks are admirable workers, worth their hire, and he has also sufficient provisions such as civilized man requires. He expected to start for New Guinea from Java about the middle of this year. The second half of the year is the favorable time for work in southeastern Dutch New Guinea along the Digul River and among the interior highlands. It is his purpose to make a careful study of these highlands, which will take considerable time. Earlier explorers to this region have felt compelled to return without making any extended sojourn among the uplands. When he wrote, two professors of the University of Christiania, Norway, were trying to raise a sufficient sum to enable two men, a Norwegian geologist and a botanist to join his enterprise. He has with him two very competent assistants: a collector of zoological specimens from the Museum in Kuala Lumpur, and a Chinese photographer from Singapore. He was already able to make himself understood in Malay and before leaving Borneo expected to speak it well. This language is essential for the traveler in the regions he is visiting.

EDUCATIONAL GEOGRAPHY

Geography in the Summer Schools

Continuation of the list printed in the May Bulletin (pp. 370-372)

Alabama. University of Alabama, University, Ala. June 11-July 22. A course for common school teachers including the study of methods, and type lessons based on localities, world, grand divisions, states, and the correlation of the subject with other school work, Miss Luther.

California. University of California, Berkeley, Cal. June 22-Aug. 1. The Lands and the Planetary Relations of the Earth—a study of land forms, their origin and changes, relations to life, formation and economic aspects of soil, physical and chemical principles involved in geographical changes, the earth as a planet, map projections, the use of maps, larger geographical features of the continents, reference books and their use, Professor William G. Reed; the Atmosphere and the Ocean—factors controlling weather and climate, physical features of the oceans, etc., Professor Reed.

University of Southern California, Los Angeles. June 29-Aug. 7. Two courses in geography: 1. The Teaching of Geography, Professor James F. Chamberlain; 2. The Geography of the United States, Professor Chamberlain.

Illinois. University of Chicago. First term begins June 15; second term, July 23. Elements of Geography—physical features and the relations of land, air and water to life, Professor Barrows, Associate Prof. Tower and Miss Lanier; Physiography—the earth's features, agencies affecting them, physiographic changes, genetic geography, with elements of meteorology and oceanography, Professors Salisbury and Trowbridge and Assistant Prof. Tarr; Economic and Commercial Geography—factors influencing the production of commodities, commercial and industrial activities of man as influenced by environment, Associate Prof. Tower; Geography of North America—its relation to the world as a whole, its physical features, climates, nature and distribution of natural resources, etc., Miss Lanier; Influence of Geography on American History—for teachers of geography and history, Miss Lanier; Conservation of Natural Resources, Professor Barrows; Geography of South America—with special attention to geographical influences on trade between the United States and South America, Associate Professor Tower; Geographical Influences in the History of the Interior, Professor Barrows; Field Geography—a study of the life and industries of selected areas to be given in September, the field being the Cumberland Plateau and the Southern Appalachians, Professor Barrows; Research Course—advanced work on selected topics for students prepared to undertake semi-independent work, Professor Barrows and Associate Professor

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Tower. Three courses in the School of Education: Geography in the Primary Grades, in the Grammar Grades, in the High School, Miss Henderson.

UNIVERSITY OF ILLINOIS, Urbana, Ill. Mr. Sumner W. Cushing, of the State Normal School, Salem, Mass., will give instruction in physiography and geography at the summer session. He will be assisted by Mr. G. W. Heitkamp.

Indiana. INDIANA UNIVERSITY, Bloomington, Ind. Physical Geography —lectures, laboratory work and field excursions, Professor E. R. Cumings; Conservation of Natural Resources—special reference to soils, forests and water power, Professor Cumings; University Geological Survey—for advanced students only, with continuous work in the field throughout the summer, Associate Prof. J. W. Beede.

Minnesota. STATE NORMAL SCHOOL, Mankato, Minn. Elementary School Geography to prepare teachers for the state examinations, Professor Arthur G. Whedon; Elementary Physical Geography, Professor Whedon; Teacher's Geography—dealing with the fundamental principles of geography and their relation to life, Professor George J. Miller; Geography of North America, with special emphasis on industrial geography, Professor Miller.

STATE NORMAL SCHOOL, Winona, Minn. Courses in Rural School Geography and the Elements of Geography, Mr. A. D. Polley.

Nebraska. UNIVERSITY OF NEBRASKA, Lincoln, Neb. June 8-July 31. Physical Geography—with laboratory and field work, Assistant Professor Filley and Mr. Eaton; Industrial Geography—a general survey of natural resources and their conservation with special emphasis on Nebraska industries, Assistant Prof. Filley and Mr. Eaton; General Geography—a course in the correlation of regional and physical geography designed to be helpful to teachers in the grades and rural schools, Mr. Eaton; Agricultural Geography of Nebraska—designed to present a study of the development and resources of the state with topography, soils, etc., considered in detail, Assistant Professor Filley; Graduate Work—Professor Condra will direct graduate studies for qualified students.

New York. BIOLOGICAL LABORATORY OF THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES, Cold Spring Harbor, L. I. June to September. Systematic and Field Botany—designed for students and teachers who wish training in methods of field and systematic study of the flowering plants, combining field and laboratory work, Professor John W. Harshberger, University of Pennsylvania.

Washington. UNIVERSITY OF WASHINGTON, Seattle. Six weeks beginning June 22. The summer school work will consist of a trip through western Washington studying the geology, physiography and the geography of the section, including the San Juan Islands, the Columbia River from Hood River to Astoria, a part of the Washington coast line, Mt. Rainier, industries of important cities, etc., Professor E. J. Saunders.

Wisconsin. UNIVERSITY OF WISCONSIN, Madison. The field courses in geography and geology, in August, under Professor Lawrence Martin, alluded to in the May *Bulletin* (p. 372), are limited to fifteen men, the party living in tents, total expense $55 to $65, the work including the mapping of physiographic features, problems in physiography, geology, glaciation, the relations of geography to human affairs, etc. For further information address Professor Lawrence Martin, University of Wisconsin, Madison, Wis.

PERSONAL

Dr. Cleveland Abbe, of the U. S. Weather Bureau, celebrated his seventy-fifth birthday at Washington, D. C., on Dec. 4 last.

Dr. Wallace W. Atwood of Harvard will continue his field studies during the summer in the San Juan Mountains in southwestern Colorado. These studies involve the working out of the physiographic history of the mountain area, the relationships of that history to the late history of the bordering plateaus and also a report on the present geographical conditions affecting the settlement and development of that part of the state.

Professor N. A. Bengtson will have charge this summer of a complete survey of an area in south-central Nebraska, twenty-four by thirty-six miles in extent. The survey will include geology, soils, water supplies, forest, and industrial development.

Professor Isaiah Bowman will be in New Haven during the summer completing the preparation of a report on his part of the work of the Yale-Peruvian Expedition of 1911.

Professor G. E. Condra will spend the summer in a reconnaissance soil survey of Nebraska and in special studies on water power problems. He is the head of the Conservation and Soil Survey of Nebraska, which has charge of all work pertaining to soils, water power and forests.

Professor R. A. Daly of Harvard will spend the summer in Europe visiting special localities in the British Isles and the Scandinavian Peninsula.

Professor W. M. Davis has been elected a life member of the Imperial Society of the Friends of Natural History, Anthropology and Ethnology in Moscow.

Mr. W. P. Haynes of Harvard will conduct a field course, for five weeks early in July, in Nova Scotia and New Brunswick.

Dr. T. A. Jaggar, Director of the Seismological Laboratory in the island of Hawaii, is on leave of absence in Japan where he is studying the recent volcanic eruptions.

Professor Lawrence Martin, of the University of Wisconsin, has been elected Corresponding Member of the Kaiserlich-königliche Geographische Gesellschaft in Vienna.

Professor George J. Miller, of the State Normal School, Mankato, Minn., will do geographical field work, in August, in the Lake Superior iron region of Michigan and Minnesota.

Dr. Otto Nordenskjöld, Vice-President of the International Polar Commission, has succeeded to the duties of the President owing to the death of Dr. Theodor N. Tschernyschew, the President, and will arrange for the meeting of the Commission in conjunction with the Eleventh International Geographical Congress at St. Petersburg in 1916.

Mr. D. W. Ohern, having voluntarily resigned as Director of the State Geological Survey of Oklahoma, Mr. C. W. Shannon has been appointed as his successor.

Dr. A. Penck, Professor of Geography at the University of Berlin, has received the Founders' Medal of the Royal Geographical Society and the Gold Medal of the Scottish Geographical Society.

Professor Karl von den Steinen, of the University of Berlin, has been elected a life member of the American Anthropological Association, Washington, D. C.

Professor W. J. Woodworth will give a course in field geology in Montana for five weeks beginning early in July.

OBITUARY

Émile Gentil. The death of this well-known French explorer is reported from Bordeaux, France. He was 48 years old. Between 1895 and 1900 he was associated with Savorgnan de Brazza in the work of exploring French West Africa and laying the foundations of its development. He was prominent in campaigns which ended in the overthrow of Rabah, the native chief in the Sudan, who attempted to prevent the occupancy of the Lake Chad region by the whites. He was Governor-General of the French Congo from 1904 to 1908.

Theodor N. Tschernyschew. This eminent Russian geologist died in St. Petersburg on Jan. 15, aged 57 years. He was one of the leading contributors to knowledge of the geology of Russia and published more than 60 scientific works in the Memoirs of the Geological Commission of Russia and the Bulletin of the St. Petersburg Mineralogical Society. He was also interested in Polar regions, lead an expedition through Novaya Zemlia in 1905 and at the time of his death was President of the International Polar Commission.

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GEOGRAPHICAL LITERATURE AND MAPS

(INCLUDING ACCESSIONS TO THE LIBRARY)

BOOK REVIEWS AND NOTICES

(The size of books is given in inches to the nearest half inch.)

ASIA

Gun-Running and the Indian North-West Frontier. By the Hon. Arnold Keppel. xiv and 214 pp. Ills., index. John Murray, London, 1911. 9s. 9 x 6.

The tribesmen on the turbulent North-West Frontier and the country beyond are constantly seeking new and better rifles with which to arm themselves. The smuggling of arms and ammunition to these hill-men is a business which at times has attained considerable proportions. After the Afridi revolt of 1897 the course of this trade in arms swung round to the North-West Frontier of India. The political history connected with this trade in rifles and ammunition, the means taken to suppress it, and the complications arising therefrom, are well set forth in this book.

WILBUR GREELEY BURROUGHS.

EUROPE

European Cities at Work. By Frederic C. Howe. xiv and 370 pp. Ills., index. Charles Scribner's Sons, New York, 1913. $1.75. 8 x 5½.

The title is too big. Mr. Howe's cities are three parts German and one part British. German cities are held up for our admiration for maintaining efficient, inexpensive public services of water, light, and transportation as well as recreation. They are beautiful and carefully planned, but not popularly administered. Our cities are as much ahead of them in this as behind in efficiency. The wishes of the German citizen are not considered, only his needs, as they appear to a highly trained, efficient person in charge. English cities own their light, water and street cars, which they operate better than private companies, but they are ugly cities and owned by a landlord class which puts huge tax burdens on the tenant-people and hinders further progress with all the power of established authority. American cities are shown to need most of all freedom from state legislation, which denies them initiative. They need home rule to solve their own problems and municipal ownership to enroll their business and professional classes, now identified with private ownership of public services, on the side of the cities. German cities are free from state control and from aristocratic ownership of their land.

MARK JEFFERSON.

Wirtschafts- und Verkehrsgeographie der europäischen Staaten. Mit besonderer Berücksichtigung der Österreichisch-ungarischen Monarchie. Von Josef Stoiser. xv and 311 pp. Carl Fromme, Wien, 1912. Kr. 2.40. 9½ x 6½.

A systematic and able study of the commercial geography of all the countries of Europe with nearly a third of the space devoted to Austria and Hungary. American teachers will find it a valuable work of reference.

Results of Meteorological Observations made at the Radcliffe Observatory, Oxford, in the Five Years 1906-1910. Under the direction of Arthur A. Rambaut. Vol. L. xvi and 130 pp. Henry Frowde, Oxford, 1912. 10s. 6d. 10 x 6½.

The results appear with reasonable promptness. The record is an unusually complete one, including, for example, observations of the amount of ozone

(twice daily) and of four rain-gauges. A somewhat unusual statement concerns the mean yearly horizontal motion of the air, which is given as 108,000 miles. It is a pleasure to look over the data in this volume. The type is refreshingly distinct and the spacing is wide. R. DEC. WARD.

British Rainfall, 1912. On the Distribution of Rain in Space and Time over the British Isles during 1912. By Hugh R. Mill, assisted by Carle Salter. 52d annual volume. 372 pp. Maps. E. Stanford, London, 1913. 10s. 9 x 5½.

Special attention is given to the great rain-storm of Aug. 25-26, which, in East Anglia, reached proportions surpassing those of any previously recorded storm in the British Isles; and to the rainfall of the summer of 1912 in England and Wales, which, although approached in the summer of 1879, was never exceeded in any summer during the last fifty years. Among the "Observers' Notes" is an account of the remarkable "glazed frost" of Jan. 17th. A photograph of one of the beautiful effects produced by this frost forms the frontispiece of the volume. R. DEC. WARD.

En suivant les Côtes de Dunkerque à Saint-Nazaire. Par Marcel-A. Hérubel. Series: La France au Travail. 2ème éd. xx and 284 pp. Ills. P. Roger et Cie., Paris, 1913. Fr. 4. 8 x 5½.

The author's main concern is to show the activities of his countrymen between Dunkirk and Saint-Nazaire. The relatively shallow depth of sea above the continental shelf has favored the development of species of fish on which Breton fishermen thrive. On the other hand, the Graville smelter near Havre owes its existence to ore transported all the way from New Caledonia. The inhabitants of this northwestern section of France have been subject to racial alterations fostered by their geographical position. The region has been a melting-pot for north European races. Many observers along the coasts of Brittany and Normandy have remarked upon the Saxon and the Viking influence as suggested in the physical appearance of the inhabitants of these two French provinces. The character and bent of mind of the Normans and Bretons strike one also as partaking appreciably of the nature of the Saxon or Scandinavian. LEON DOMINIAN.

Voyage en France. 58e Serie: Calaisis, Boulonnais et Artois. Par Ardouin-Dumazet. viii and 351 pp. Maps, index. Berger-Levrault, Paris, 1912. Fr. 3.50. 7½ x 5.

The previous edition dates back fifteen years and this period has seen large changes in the industry, agriculture, bathing resorts and leading ports of the North Sea and English Channel. Twenty-seven maps and sketches are included in the text and there is a large folding map of the region. The revision is a welcome, and indeed a necessary part of the attempt to make the whole work a complete picture of the country, not failing to include Alsace-Lorraine, the "Provinces perdues," which "l'auteur a pieusement fait figurer dans son œuvre." A. P. BRIGHAM.

Die Berner Alpenbahn (Lötschbergbahn). Dargestellt von Dr. Ed. Platzhoff-Lejeune. 72 pp. Maps, ills. O. Füssli, Zürich, 1913 (?) 7½ x 5.

How easily geographers explain the route locations of the past! This little history of the newest Alpine tunnel records half a century of earnest discussion of alternatives, with a popular vote finally deciding against the dictum of a board of foreign engineers! It may be predicted that the official name "Berner Alpenbahn" will have to yield to the "Lötschberg route."

To get to Italy from Bern one must cross two east and west ranges of Alps with the east-west Rhone valley between. Long since the southern range was pierced by the twelve mile long Simplon tunnel, but the Italian train, emerging from this, had to make a long detour down the Rhone valley to go around the northern range—the Bernese Oberland. Since 1912 this seventy-five mile detour is saved by the piercing of the nine mile long Lötschberg tunnel through the northern range. The Bern folks are now two hours nearer Italy and hope to

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see much traffic between Paris and Milan come their way over the French Eastern Railroad. Twenty-nine admirable illustrations. MARK JEFFERSON.

Gates of the Dolomites. By L. Marion Davidson. With a Chapter on the Flora of the Dolomites. By F. M. Spencer Thomson. xvii and 332 pp. Ills., index. John Lane Co., New York, 1912. $1.50. 8 x 5½.

The Dolomites are mountains of magnesium-limestone, usually massed in groups, extending over about a fifth of the Tirol. The Dolomites, proper, have an area of fifty by forty miles. Although they are becoming more and more frequented, there are many parts as yet untraveled by the ordinary pleasure-seeker. Thus these mountains afford recreation not only to those who prefer luxury and society, but also to those who seek the purity and quiet of nature. The author gives full directions regarding the numerous points of interest and how to reach them; the kinds of roads; hotels; guides; normal weather conditions; flora of the Dolomites; history of the Tirolese; and, enlivening the pages, accounts of the author's own experiences and adventures. The book is handsomely illustrated with photographs, and a map. To all who contemplate a visit to the Tirol, this volume is to be recommended.

WILBUR GREELEY BURROUGHS.

Die Geographische Entwicklung des Rheindeltas bis um das Jahr 1500. Eine historisch-geographische Studie. Von Arnold Norlind. xix and 272 pp. Index. Gleerupsche Univ.-Buchhandlung, Lund, 1912. Mk. 5. 9 x 6.

The author reaches the conclusion that the most essential changes in the configuration of the country have been caused by the correction of nature by man. The original inhabitants did nothing to protect the country against the attacks of the sea but rather exposed it more by digging the peat all over the country, thereby contributing to lowering its level. The Romans constructed dams and canals; but after their withdrawal little of their work survived, and it was not until the time of Charlemagne that authentic information was again available. In the interval the Lek seems to have gained at the expense of the former "Old" Rhine, so that the latter soon disappeared, the process being probably hastened by a storm flood which blocked its mouth between 840 and 860 A D. Also the "Krumme" Rhine and the Vecht declined, while the Yssel and the Waal became the leading waterways for the traffic north and west. The relation of the Waal and the Maas seems to have changed repeatedly, the most important change being of a catastrophic nature when, in 1421, seventy-two parishes were destroyed and a perfectly new branch, the Nieuwe Merwede, was formed in consequence of one of the few floods whose actual occurrence cannot be doubted. The formation of the Zuider Zee, on the other hand, seems to have been preeminently the work of the slow normal processes of nature, and that sea is doubtless much older than has generally been supposed. Most of it was already formed in the oldest times when the sea ate away the then unprotected land without anybody noticing or preventing it. Later, in the twelfth and thirteenth centuries, a number of fatal storm-floods did actually occur; but nothing is said in the records about loss of land caused by them, only loss of human life and of cattle being deplored. The fact is, that, at that time, the land was already protected by dikes; when a dike broke, loss of life and property might be heavy, but the dike was rebuilt, and no land lost. There is but one authentic record of actual loss of land—the destruction of the land connection between Enkhusen and Stavoren. It may safely be said that from the beginning of the Middle Ages, loss and gain of land have been about equal in the Netherlands. M. K. G.

Bericht über die Tätigkeit des Königlich Preussischen Meteorologischen Instituts im Jahre 1912. 172 pp. Maps, ills. *Veröffentl. Kgl. Preuss. Met. Inst. Nr. 256.* Berlin, 1913. Mk. 6. 10½ x 7½.

A "report on the activities of a meteorological institute" sounds like a dry and uninteresting summary of details of routine administration; and that is what many such reports are. But the annual report of the Prussian Meteor-

ological Institute is very different. It brings, each year, a big grist of important meteorological papers, as well as the preliminary summary of the Institute's activities prepared by Dr. Hellmann. In fact, over three-fourths of the present volume is taken up with original contributions on meteorological subjects. Of these, the most general interest centers around Dr. Hellmann's account, which has special interest for the student of folk-lore, of the Thuringian "flood" of 1613. This "flood" was caused by a cloudburst over the hilly country about Weimar, and resulted in the loss of 500 lives as well as great loss of stock and of property. Dr. Hellmann has made a thorough study of all the existing writings relating to this "flood"; gives a vivid account of it, and reproduces, in facsimile, the title-pages of twenty-four publications bearing upon the disaster. Among other contributions are papers by E. Barkow, on the structure of the wind; by K. Langbeck, on the storm damage of May 12, 1912, in Germany, and by G. Schwalbe, on the unusual cold of August-October, 1912.

R. DEC. WARD.

La Grèce d'aujourd'hui. Par Gaston Deschamps. 12ème édition. 408 pp. Armand Colin, Paris, 1910. Fr. 3.50. 7 x 4½.

Au Pays Russe. Par Jules Legras. 4ème édition. 362 pp. Armand Colin, Paris, 1910. Fr. 3.50. 7½ x 5.

These two books, published in the same year and both "crowned by the French Academy," deserve to be reviewed jointly. They cover, geographically, the greatest portion of eastern Europe, and resemble one another in their treatment of geographical features; but in other matters each book presents the peculiarities, not only of the topics but of the writers themselves. In the far superior work of Mr. Deschamps, although devoted to solid antiquarian studies, the author has successfully avoided "talking shop" in his descriptions. While it is impossible to treat of Greece as a country, and of its people without alluding to its classic past, we are not overwhelmned with excessive shoveling and curiosity hunting. The mention of such meritorious performances appears as a natural component of the subject. Greece would not be Greece without its ancient remains. These remains are so interwoven with nature and nature is so well pictured in true colors that we feel the intimate connection of both. The same may be said of the descriptions of the population of to-day. Be it in Athens or in the country, the characteristics of the inhabitants appear to result naturally from the resources and lack of resources of their land. It is a charming book, full of life well portrayed, of solid knowledge agreeably presented, instructive for the past and present, significative for the future.

Mr. Legras seems to be a successful newspaper correspondent compared with Mr. Deschamps. He writes well, in a sprightly manner, and in his attempts at picturing landscape displays a great fancy for colors and active hunting for tints. His subject is, as far as nature goes, one of great sameness and monotony. The contrast of the enormous plains of Russia with the varied landscape of little Greece is very strong. Mr. Legras paints that monotony very well, while making desperate efforts to relieve it. His principal object, however, is to present the life of the peasantry and the "burghers" at home and in their intimate relations. For the higher classes he has only condemnation, while confessing that he does not know them at all. The book is inspired by personal relations with Count Tolstoy and breathes unbounded admiration for him. It is very entertaining in many ways. His pictures of famine and of the cholera are often ghastly, but may be true.

AD. F. BANDELIER.

Malta and the Mediterranean Race. By R. N. Bradley. 336 pp. Map, ills., index. T. Fisher Unwin, London, 1912. 8s. 6d. 9 x 6.

Up to a point near the end of the second third of the volume this work has a great, though essentially fragmentary, value. Mr. Bradley assumes the reader's acquaintance with preceding archæological research on Malta and its islets. To this he adds in careful detail the highly interesting results of his

own extensive and careful search in the ruins of a civilization now recognized as antedating the European migration of Aryan ancestors. As a continuation of former research this volume will be absolutely necessary to every student of the Maltese. But the final third of the volume, his disquisitions upon the major theme to which Malta is sought to be adjusted, his deductions from his discoveries, that is far other. After reading his chapter in which he equips our earliest English roots with a Hamitic or Semitic ancestry in a mysterious portage by neolithic man through the Kelts, I began to wonder if it were not a jest; for it is only recently that after the review of a work on the Scot in Canada the learned author took me to task for failing to see his little joke. The jest motive seems involved in the suggestion that the militant suffrage appeal and the quips of George Bernard Shaw are a neolithic inheritance. Unfortunately there is a sad gravity about his explanation of the difference in intellectual quality between the dolichocephalic and the brachycephalic. Recognizing that intellectual quality varies with the association centers of the brain and accepting as proven the theory of the neura as establishing the activity of association, he proposes the following conclusion: "Applying this theory to our two shapes of brains, it seems probable that in a long flat brain these numerous and complex connections could not take place so easily as in a round compact one, *where the dendrons would be close enough to intergrapple generally.*" In succeeding pages he develops this thesis and it is altogether the most remarkable contribution to folk psychology that I have ever encountered. WILLIAM CHURCHILL.

L'Albanie Inconnue. Par Gabriel Louis-Jaray. Préface de M. G. Hanotaux. 3ème édition. xxiv and 239 pp. Map, ills. Hachette et Cie., Paris, 1913. Fr. 4. 7½ x 4½.

Few regions are known so meagerly as Albania. The consequence is that although Mr. Jaray's route is in Old Europe, his narrative is entitled to rank as a pioneer contribution. One cannot help thinking, after reading the book, that Albania was better known to the Romans than to the present generation.

The region described should be divided into two sections. The inhabitants of the district between Uskub and Prizrend *via* Mitrovitza may boast of having seen a few civilized travelers. Real exploration of the unknown begins farther west in the mountainous region overhanging the valleys of the Drin. The scenery as well as the customs and appearance of the inhabitants are portrayed. Some of the descriptions of important localities have been written with much detail, that of Uskub for example. The book helps the reader to form a fairly accurate idea of the social conditions prevailing in Albania. The successful attempts of the Albanians to settle in the lowlands surrounding their mountains is recalled. Mr. Jaray shows how, at Ipek, the Albanians gradually dislodged the Servian inhabitants of the surrounding agricultural districts. He does not allude, however, to the favor with which this movement was regarded by the Turkish authorities. The campaigns of the Servians during the Balkan War dealt a death-blow to this Albanian easterly movement. The author has inserted travel data at the end of each chapter full of valuable information. LEON DOMINIAN.

POLAR

The Former Eskimo Settlements on the East Coast of Greenland between Scoresby Sound and the Angmagsalik District. By G. Amdrup. Ills. *Meddelelser om Grønland*, Vol. 28, Afd. 2, pp. 287-542. Copenhagen, 1909. 9½ x 6½.

Of the seven papers in this part three deal with the anthropology of the recently opened east coast: a summation by Knud Poulsen on the anthropology and nosology of the East Greenlanders, a review by G. Amdrup of his exploration of the abandoned Eskimo settlements between Scoresby Sound and the Angmagsalik district, and by W. Thalbitzer an ethnological descrip-

tion of the artifacts collected by Amdrup. At Angmagsalik there are two traditions as to inhabitants along the coast to the north and, in the present conditions of life, inaccessible from this southern settlement. One tradition records the departure of some of the southern Eskimo from Angmagsalik for the unknown north and their failure to return. The other is a much hazier recognition of the fact that Eskimo lived somewhere along the northern coast but had never been seen within the memory of the wisest of the old men.

Capt. Amdrup had brilliant success in running down each tradition. Of the boat migration of thirty souls from Angmagsalik in 1882 he was able to identify the fate, for at Nualik he discovered the ruins of a settlement quite in the southern style of house construction and brought back to Angmagsalik utensils picked up in the ruins which were absolutely identified as having been in the possession of this or that member of the lost migration. The existence of a former population on the northern coast was established with equal success. In every habitable site which he visited Capt. Amdrup found remains of settlement in the shape of house ruins, tent rings and graves. Working in the territory between the discoveries of Holm on one side and Ryder on the other Amdrup explored a line of coast which had never been visited by a white man, and succeeded in establishing the fact that it was once, though no longer, inhabited by Eskimo. WILLIAM CHURCHILL.

Tre aar paa Grönlands Ostkyst. By Ejnar Mikkelsen. 300 pp. Map, ills. Gyldendalske Boghandel, Copenhagen, 1913. Kr. 8. 10 x 7.

The English edition of this work was reviewed in the *Bulletin* (November, 1913, p. 862).

Observations Météorologiques. Par J. Rouch. Deuxième Expédition Antarctique Française (1908-10) commandée par le Dr. Jean Charcot. 260 pp. Ills. Minist. de l'Instruc. Publique et Masson et Cie., Paris, 1911. 11 x 9.

This volume gives a complete account of the meteorological observations during the winter on Petermann I., as well as of during the voyage of the *Pourquoi-Pas?* Rouch, who had charge of the meteorological work and prepared all data for publication, accomplished his task in a most satisfactory way. The hourly observations on Petermann I. extend from February to November, 1909. To the monthly tables of atmospheric pressure, temperature, etc., is added a meteorological journal (p. 89-144) giving day by day a description of the weather and of the meteorological phenomena. Involuntarily, Rouch gives to the reader material for a psychological study of the effects of the antarctic winter. The observations of June 28th till Sept. 12th, in particular, show very plainly how shortage of daylight and then the progressive increase of the length of the day, act upon the imagination of the observer. There is an annual variation of mental activity, of imaginative susceptibility, which seems to be greatly intensified in polar regions. Rouch's journal is good material for the study of this variation. Among the observations of much interest are diagrams of the short barometric waves registered with the aid of Richard's statoscope. Only fourteen of these curves are reproduced. Up to this time extensive statoscopic investigations have never been attempted and therefore the registrations of the French Expedition will probably have an historical interest. HENRYK ARCTOWSKI.

MATHEMATICAL GEOGRAPHY AND CARTOGRAPHY

Das astronomische Weltbild im Wandel der Zeit. Von S. Oppenheim. Series: Aus Natur und Geisteswelt. 2. Auflage. 134 pp. Ills, index. B. G. Teubner, Leipzig, 1912. Mk. 1.25. 7½ x 5.

This edition differs little from the first excepting that a detailed index adds to its usefulness. The first edition appeared seven years ago and the work is recognized as an authoritative, condensed treatment of the development of the science of astronomy from the earliest times to the present day.

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Masse und Messen. Von Dr. Walter Block. Series: Aus Natur und Geisteswelt. 111 pp. Ills., index. B. G. Teubner, Leipzig, 1913. Mk. 1.25.

Gives brief attention in the introduction to the origin and development of the science of measurements. The body of the book is devoted to the scientific bases of the existing systems of measurements of space, length, weight, etc., and to thermal, optical and electrical measures and the methods and mechanical means involved in the deduction of the various data.

Leonardo da Vinci e la Cartografia. Di M. Baratta. 28 pp. Officina d'Arti Grafiche. Voghera, 1912. 9½ x 6½.

This appreciation of the famous painter's cartographic products is somewhat marred by perfervid language. Da Vinci's training as an engineer obliged him to be a draughtsman. This phase of his activity has been classified by the author under the two heads of sketch plans and general maps. It is shown that in both the artist's skill enhanced the faithfulness of his map products. General interest must necessarily attach to the list of maps attributed to this great genius who was certainly one of the ablest cosmographers of his day. Reproductions of a few speciments of Da Vinci's maps in this monograph would have enhanced its value. LEON DOMINIAN.

GEOPHYSICS

Land Magnetic Observations, 1905–1910. By L. A. Bauer. 185 pp. Ills. Researches, Dept. of Terrestrial Magnetism. Carnegie Inst., Washington, D. C., 1912. 12 x 9½.

Dr. Bauer has here presented many valuable series of observations taken on land at check stations which are intended to serve as controls upon the observations recorded in neighboring seas.

Erdmagnetismus, Erdstrom und Polarlicht. Von Dr. A. Nippoldt. Sammlung Göschen. 2. verbesserte Auflage. 143 pp. Ills. G. J. Göschen, Berlin and Leipzig, 1912. 90 pfg. 6½ x 4½.

The present edition has been somewhat enlarged to include recent developments in the science. This is a standard work on terrestrial magnetism and a concise treatment of the subject which, though technical in part, is also adapted to a considerable extent for general reading. Its author is one of the best known authorities on the subject.

PHYSICAL GEOGRAPHY

Die Eiszeit und der vorgeschichtliche Mensch. Von Dr. G. Steinmann. Series: Aus Natur und Geisteswelt. 96 pp. Ills. B. G. Teubner, Leipzig, 1910. Mk. 1.25. 7½ x 5.

Discusses the Ice Age, glacial cycles, the action of ice and of water, glacial relief, moraines, changing of river courses, formation of loess and clay, prehistoric man, the age of the human race, and answers many questions such as "how does ice flow?"

Schnee und Eis der Erde. Von H. Wieleitner. Series: Bücher der Naturwissenschaft. 198 pp. Ills., index. P. Reclam, jun., Leipzig, 1913. Mk. 1. 6 x 4.

In this small book are condensed the leading facts in relation to snow and ice, not as meteorological factors but as to their physical nature and properties and the impress they make upon the face of the earth. The book is designed for the perusal of the intelligent laity and fits well into the scheme of the series—the practical popularization of science.

OCEANOGRAPHY

The Depths of the Ocean. A General Account of the Modern Science of Oceanography based largely on the Scientific Researches of the Norwegian Steamer *Michael Sars* in the North Atlantic. By Sir John Murray and Dr. Johan Hjort. With Contributions from Prof. A. Appellöf, Prof. H. H. Gran and Dr. B. Helland-Hansen. xx and 821 pp. Maps, ills., index. Macmillan & Co., Ltd., London, 1912. £1 8s. 9½ x 6½.

Geographers and other general readers will find this an up-to-date treatise on oceanography. The *Michael Sars* is the tiny steam trawler of the Norwegian "fisheries," which has explored the Norwegian Sea in great detail since 1900. Sir John Murray suggested her four months' trip into the Atlantic in 1910; went with her, and bore a generous part of the expense. European shelves and the slopes to the deep ocean were explored as far south as the Canaries, from there the ocean was crossed to Newfoundland *via* the Azores, and return made to Bergen by way of Glasgow.

The intention was to add the light of Atlantic comparisons to the results of the researches of the *Michael Sars* in Norwegian waters. Incidentally a number of stations occupied by the *Challenger* in 1873 were reoccupied, and observations repeated with the improved apparatus of to-day. It is highly creditable to Murray's open-mindedness that he should urge the application of the newest thought and appliances to studies which long ago brought him established fame, and be able to work alongside and through some of the best trained men of 1910.

Dr. Johan Hjort, of the Norwegian "Fisheries," was in command of the expedition and writes the description of the *Michael Sars* and her apparatus, the account of the cruise of 1910, and chapters on bottom fishes, pelagic animals, and general biology of the ocean. Sir John Murray contributes an historical review and 180 pages on the depths and deposits of the ocean. This covers all the oceans, and is illustrated by colored charts of depths and deposits. Murray's general chapters and the narrative of the voyage of 1910 are the main threads of interest, illustrated by the special papers.

At Gibraltar they made the first velocity studies of the upper and lower currents. The westward under-current varied in speed from one fourth knot to five knots. On one occasion it extended from the bottom to the top for an hour, but its usual upper limit was at depths between fifty and 150 meters. The upper current, as was known, is usually to the east. Its speed was found to vary between one and three knots. The changes in the currents coincided in time with tidal changes outside. Temperatures and salinity were thoroughly investigated at all depths in the Spanish Bay outside the Straits. The use of the current meter enabled Helland-Hansen to detect currents with tidal change of "set" in the deep ocean west of the Canaries at depths of 915 and 1,830 meters, the total depth there being 5,000 meters. As the ship had to drift there, absolute velocities were not ascertainable. The same tidal set was observed and a current of a half knot measured across the mid-Atlantic Ridge south of the Azores, where the ship was anchored for fourteen hours in 900 meters, the current meter being at 732 meters depth.

The few catches on the mid-Atlantic Ridge give a hint of greater abundance of life there than over greater depths. Everything confirms the sparsity of life in the greatest depths. There is interest in every page of the volume, and while it notes great progress in knowledge it opens out new fields for study in every direction. MARK JEFFERSON.

La Vie dans les Océans. Par Dr. L. Joubin. In Series: Bibliothèque de philosophie scientifique. 334 pp. Ills. Ernest Flammarion, Paris, 1912. Fr. 3.50. 7½ x 4½.

The author uses very few pictures in his book, which is popular but clear and written with real literary skill. He has selected his matter with care and presents it vividly.

All the properties of the ocean that touch nearly on life are described fully enough to show their bearing. Mainly they are motions, temperature, pressure, composition, and lighting. None are allowed to lead us aside from our object.

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This is the more striking as the ocean is the seat of such complexity and variety that treatment of it is always likely to run off into disconnected detail. The parts of the book that deal most with geography are the accounts of corals and the spreading of life into the depths from the sunny continental shelves where it originated, an expansion here dated from the Cretaceous. Depths of 7,000 to 10,000 meters are almost lifeless, yet pressures in the deeps are not so burdensome to life as has been said. Gases are under no extraordinary compression. There is no spouting when the deep water bottle is opened and change of temperature rather than of pressure accounts for the death of the creatures brought to the surface. We have heard of sea phosphorescence, seen a little even, but Joubin gives us an impression of it that is typically novel. We may read Murray's account of the same facts and learn of the same light projectors with lenses and reflectors that the French author describes but it is only the latter who gives a feeling of the radiance of some of these creatures, which suggests to the eyes of the mind occasional regions of submerged splendor. We can almost see some of these fish dart up with all their lateral spots aglow like tiny ocean liners in the night.

The coral chapter is admirable for any one who once learned Darwin's theory of reefs to find it later denied but found the alternatives somewhat unclear. Our author gives seven theories and leaves the impression that all may have application!

MARK JEFFERSON.

Étude sur les Marées. Par R. E. Godfroy. In series: Documents Scientifiques, Sciences Physiques. Deuxième Expedition Antarctique Française (1908-1910) commandée par le Dr. Jean Charcot. 74 pp. Maps, ills. Masson et Cie., Paris, 1912. 11 x 9.

The present report forms an important contribution in the domain of Physics to the scientific work of the second Charcot expedition. It is a beautifully printed and arranged document of 74 pages and 11 plates, published under the direction of Professor L. Joubin, of the Natural History Museum, and under the auspices of the Minister of Public Instruction.

The region in which the study was made, forming the connection between the Pacific and the Atlantic oceans, is of the greatest interest to oceanographers. As the author points out, the late Sir George Darwin laid great stress on the importance of obtaining systematic and careful observations of the behavior of the tides in this place.

Previous observations are exceedingly meager, and have extended over too short a period to be of value in establishing a theory of tide movements. We have observations by Scott, Courceille-Seneuil, Bruce, and those made in the first Charcot expedition, but none have been over such an extended period as the present. The expedition, which lasted for thirteen months, was directed between the following stations: (1) Amirauté Bay, South Shetlands, (2) Port Foster, Ile Déception, (3) Port Lockroy, Ile Wiencke, (4) Port Circoncision, Ile Petermann, (5) Marguerite Bay, Ile Jenny. The report is arranged as follows: A description of the tide gauges used, the installation of the apparatus and the difficulties overcome, the method of taking observations, the interpretation of the curves taken with the tide gauges, the method of analyzing the curves, the more important harmonic constants for the various stations, and a set of complete tables of results. Some very fine curves and diagrams are given in the illustrated section at the end of the work, which are arranged so as to bring out in a helpful manner a comparison of the various stations.

The tide gauges used were of elaborate pattern as compared with most work of this kind, and the author's devices for overcoming the low temperature were interesting. The gauge most used was designed by Favré, and made by Richard, but an ordinary Richard gauge was also used to check the results. The instruments are said to have worked perfectly.

The harmonic analysis of the curves was carried out by the well-known method of Kelvin.

The relation of meteorological effects to tide changes was studied, and it was proved to the entire satisfaction of the author that there is a decided barometric effect on the surface of the sea. This is of interest in view of the

report of the Committee of the British Association in 1896 to the contrary. The author finds a movement of 1 mm. in the barometric column to correspond immediately with an inverse movement of the level of the sea, amounting to 1.45 cms.

The author finds the periods of the diurnal and semi-diurnal tides very irregular. The observations show that the diurnal tide is propagated from East to West through Drake Strait.

Although very irregular, the mean value shows a period for the diurnal tide as follows:—At Orange Bay 44 hours, in Scotia Bay 14.5 hours, and 5 hours at Port Foster and Port Circoncision. The same values for the semi-diurnal tide are, 29 hours at Orange Bay, 25 hours at Scotia Bay, 48 hours at Port Foster, and 104 hours at Port Circoncision.

In conclusion, the author emphasizes the great irregularity of the tides in this region, which do not satisfy either the old ideas of Whewell, or those more recent of Rollin A. Harris. His study shows the law of the tides to be very complex and troublesome, although the situation offers a maximum number of the conditions for the theory.

H. T. BARNES,
McGill University, Montreal.

METEOROLOGY AND CLIMATOLOGY

Climate and Weather. By H. N. Dickson. Series: Home University Library. 256 pp. Index. Williams & Norgate, London, 1913 (?). 1s. 7 x 4½.

Not until the ninth chapter does the work become popular. This section entitled "Climate and Vegetation," and the next and last chapter, "Climate and Man," will perhaps make the strongest appeal to the interest of the teacher of elementary geography or to the layman.

The division of the Earth into climatic regions (p. 137) is somewhat different from the usual. It is based upon the wind system including the following divisions: 1. The equatorial belt; 2. The trade-wind belts, north and south; 3. The high-pressure belts, north and south; 4. The west-wind belts, north and south; 5. The circumpolar caps; 6. The monsoon region of south-eastern and eastern Asia; 7. The Tropical; 8. The Sub-Tropical.

The discussion of the monsoon region introduces some interpretations different from those generally presented on the subject. The summary, p. 152, indicates three seasons: "Cold weather, hot weather, rainy."

EUGENE VAN CLEEF.

Nouvelle Méthode de Prévision du Temps. Par Gabriel Guilbert. Avec une préface par Bernard Brunhes. xxxviii and 343 pp. Maps. Gauthier-Villars, Paris, 1909. 10 x 6½.

In April, 1891, Gabriel Guilbert explained to the French Meteorological Society his new practical rules for weather prediction. In 1905 a competition in weather forecasting was held at Liège, and Guilbert received the first prize. The present volume gives the essentials of the new system, with a large number of examples. The essential thing is the isobaric chart of tomorrow. Given the isobars, the normal wind which is to be expected under the given isobaric system enables the forecaster to judge how far, and in what direction, the cyclone (the principal factor in weather-making) may be expected to move, and whether the depression is likely to deepen or fill up. When the winds are not normal, in direction or velocity, the author considers this an indication of the presence of some external influence. The system is then likely to move in the direction of least resistance, indicated by the deviation of the (actual) winds from the normal.

This whole new scheme has attracted considerable attention among meteorologists the world over, and it is safe to say that since the publication of Guilbert's book many forecasters have been putting his ideas into practice. The volume is hardly one that will appeal to the general student of meteorology, but those who want to be fully informed regarding the progress of the science in all its branches will not wish to be ignorant of it. The Preface is by

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Brunhes, Director of the Puy de Dôme Observatory, who, it may be noted, is not entirely in agreement with all of Guilbert's ideas. R. DEC. WARD.

Die Schneegrenze in verschiedenen Klimaten. Von Dr. Viktor Paschinger. 93 pp. Maps, diagrams. *Ergänzungsheft No. 173 zu Pet. Mitt.*, Gotha, 1912. Mk. 7.80. 11 x 7½.

The height of the snowline, and its controls, have been investigated by many writers, among whom de Saussure, von Humboldt and Ratzel may be mentioned. Heim (*Handbuch der Gletscherkunde*, pp. 18-21) and Berghaus (*Behm's Geogr. Jahrb.*, Vol. I, pp. 258-267, Vol. V, p. 472) have given tables of the heights of the snowline in different mountains. In his *Handbuch der Klimatologie*, Vol. I, 3d. ed., von Hann gives an excellent summary of this whole matter. Those who have concerned themselves with the snowline have, however, for some time felt the need of a further and a more thorough investigation of the question, in the light of the latest and most complete data now obtainable. Dr. Viktor Paschinger, of Graz, has given us the desired monograph—a very complete and satisfactory presentation of what is, for many reasons, a difficult and confusing subject. Nearly two-thirds of the report is taken up with a detailed summary and critical examination of the data concerning the height of the snowline in all parts of the world, with copious references to the authorities. The remaining third deals with the relations between the snowline and the climatic elements. The author clearly recognizes that the snowline is essentially the resultant of climatic controls, and that, therefore, an investigation of the snowline is an important subdivision of climatology. Perhaps the most interesting of the plates is the curve showing the altitude of the snowline at different latitudes, from 80° N. to 65° S. R. DEC. WARD.

Luft- und Meeresströmungen. Von Dr. Franz Schulze. Sammlung Göschen. 149 pp. Maps, ills., index. G. J. Göschen, Leipzig, 1911. 80 pfg. 6½ x 4½.

The principal object of the book is to serve as an aid to young German seamen in their preparation for their examinations for the position as captain. It aims to condense, within the limits of 150 small pages, the most important facts concerning the winds and the ocean currents. A short introduction explains, for the benefit of the layman, the meaning of some of the more common nautical terms. The author is Director of the School for Navigation at Lübeck, has had nearly thirty years' experience in teaching navigation, and was at sea for ten years. The title is somewhat misleading, in that, under *Luftströmungen*, such special winds as the föhn, mistral, bora, etc., as well as tropical cyclones and tornadoes are considered. The little book therefore really deals with the whole subject of winds, as well as with ocean currents, and it does this in a very clear and satisfactory manner. R. DEC. WARD.

Brief List of Meteorological Textbooks and Reference Books. A selection of works suitable for general, scientific, and university libraries in the United States. 3d edition. By C. F. Talman. 22 pp. Index. Weather Bur., Washington, 1913. 9 x 6.

The Weather Bureau has recently issued the third edition of the useful Bibliography prepared by Professor Talman. We have here about 150 titles, carefully selected, classified and indexed, and brought down to date, the whole forming an excellent "working" bibliography for teachers and students of meteorology and climatology. In these days of the rapid increase of meteorological literature, this selected list of titles will prove very acceptable to those who are making a serious study of the science of the atmosphere.
R. DEC. WARD.

Contribution à l'Étude des Relations existant entre les Circulations atmosphériques, l'Électricité atmosphérique et le Magnétisme terrestre. Par Alfred Vialay. viii and 200 pp. H. Dunod et E. Pinat, Paris, 1911. Fr. 6. 10 x 6½.

The author has endeavored to correlate the general atmospheric circulation

with the phenomena of atmospheric electricity and of terrestrial magnetism. His views are generally at variance with those which are commonly held today. For example, on the purely meteorological side, he believes that the ordinary explanation of the monsoons of the Indian region is absolutely wrong. The author has evidently read widely, but his book is not one which is likely to have many readers, nor will his views have many supporters. R. DEC. WARD.

Atlas photographique des Nuages. Par Julien Loisel. 20 ills. G. Thomas, Paris, 1912 (?). 14 x 10½.

We have here some very beautiful reproductions showing even the minute details of cloud structure. When such remarkable photographs are available, we are almost reconciled to the absence of color in the pictures. There are five photographs of cirrus; eight of alto-cumulus; one of alto-stratus; three of cumulus; one of nimbus; one of cumulo-nimbus, and one of strato-cumulus. The author, unfortunately, has not followed the International Cloud Classification, and this fact will militate against the general use of this otherwise most acceptable atlas. It is a pity, when international agreement has accepted a certain cloud classification, to have authors adopting and advocating an independent scheme. R. DEC. WARD.

PHYTOGEOGRAPHY AND ZOOGEOGRAPHY

Plant Physiology with special reference to Plant Production. By Benjamin M. Duggar. Rural Text-Book Series. xv and 516 pp. Ills., index. Macmillan Co., New York, 1911. $1.60. 7½ x 5½.

The progress of agriculture is becoming increasingly dependent upon the application of the facts and principles of plant physiology, and at the same time both investigation and instruction in plant physiology are coming to bear a closer relation to the service which may be rendered to agriculture. The college text-book under notice is an outcome of these tendencies, and is also calculated to strengthen them.

Professor Duggar has placed special emphasis on the growth of nutrition of plants and on the allied functions, and has touched lightly on the tropisms and such subjects as growth movements. The treatment of transpiration, the water requirement of plants, and mineral nutriments is particularly strong, and, throughout the book, illustration of physiological principles by practical results in plant production is calculated to stimulate the interest of the student. The topics are so handled as to suggest the desirability of more knowledge, and the copious literature references will lead the student to original sources.

FORREST SHREVE.

The Life of the Plant. By C. A. Timiriazeff. Translated from the revised and corrected seventh Russian edition by Miss Anna Chéréméteff. xvi and 355 pp. Ills. Longmans, Green & Co., New York, 1912. $2.50. 9½ x 6½.

In 1878 Professor Timiriazeff, of the University of Moscow, published a series of lectures on the physiology of plants, the popularity of which has carried them through seven Russian editions.

The series was recently revised and translated into English under the title "The Life of the Plant." The book is an admirable semi-popular representation of a scientific field which has a forbidding look to many.

The ten lectures are arranged on a plan which emphasizes throughout their progress, the close interrelation of function and structure in plants. The field of plant physiology is oriented with relation to other sciences, both historically and philosophically, and some of the larger problems of biology are touched upon.

The author was one of the early adherents of the mechanistic view-point in physiology, to which he adheres throughout these lectures both in spirit and in language. The use of the words "adaptation" and "adapted," in the English translation, may cause some alarm as to the soundness of the author's biological philosophy, but there is no occasion for it. From a strictly technical

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standpoint the facts in Professor Timiriazeff's book are not brought down to date. While it is easy to find faults in the scientific statements in such a book, it is not easy to find specialists who are both willing and able to write books for the general reader.

The tasks and aims of plant physiology are in serious need of being better known to a wider audience, and The Life of the Plant is one of the few books through which this may come about. FORREST SHREVE.

Animal Geography. The Faunas of the Natural Regions of the Globe. By Marion I. Newbigin. The Oxford Geographies. 238 pp. Ills., index. Clarendon Press, Oxford, 1913. 4s. 6d. 7½ x 5.

In treating of organic responses to physical laws, most attention is here centered on plants and mankind. Animal geography has scant attention, but the author has blazed the trail to an interesting and important phase of geographical study. The globe is divided into eight natural regions, as the tundra, the coniferous forest, the steppe, etc., and the fauna of each are described. The presentation under each type is strictly geographical following the logical order of causes and effects. The reader is introduced at the outset to the physiographic controls of the regions and then follow the general responses of all animal life as in migration and the specific responses of individual species. The book will be found of great value. ROBERT M. BROWN.

ANTHROPOGEOGRAPHY

Ancient Town-Planning. By F. Haverfield. 152 pp. Plans, ills., index. Clarendon Press, Oxford, 1913. Oxford Univ. Press, New York. 6s. 9 x 6.

This volume is but an essay toward a primer of the elementary study of this newly constituted branch of demography. The author outlines the initial condition of civic communities in the Greek and Latin culture areas. In the latter he seems somewhat slurring in his disposition of an important element. In his preface he comments upon the terms *scamnirt* and *strigirt* as unpleasant, needless and inaccurate. The pleasure lies in the German treatment of Latin material after Germanic habit. We may readily employ the terms according to the genius of our own speech as scamnate and strigate. We should regret to lose the precision of these terms of the ancient surveyor's art, for according as land was divided as scamnate or strigate we are brought into touch with the origin and character of the town street, as common or king's highway on one side, or as path of temporary convenience becoming by right of user an indefeasible easement. This division is essential in the study of the manner of growth of any town, whether ancient or modern.

Prehistoric Times as Illustrated by Ancient Remains and the Manners and Customs of Modern Savages. By the late Rt. Hon. Lord Avebury. Seventh edition, 623 pp. Ills., index. Henry Holt & Co., New York, 1913. $3.50. 9 x 6.

Recounts the latest facts and theories concerning the prehistoric traces of man. Its especial value is that it affords the educated man who is without special training an opportunity of acquainting himself with all the facts from which the age of man upon earth must be calculated, of making himself familiar with the latest scientific conclusions from these facts and of forming an opinion of his own. The chapter on the antiquity of man inclines to the view that man or some semi-human ancestors of man existed in Pliocene times, and that the predecessors of man in Miocene times were sufficiently advanced to make use of rude stone implements. The concluding chapters treat of modern savages as throwing light on their prehistoric progenitors.

DAVID H. BUEL.

HISTORICAL GEOGRAPHY

Journal of Jasper Danckaerts, 1679-1680. Edited by Bartlett Burleigh James and J. Franklin Jameson. Series: Original Narratives of Early American History. xxxi and 313 pp. Ills., index. Charles Scribner's Sons, New York, 1913. $2.50. 9 x 6.

The introduction by Dr. James has the following very just characterization of the book and its author:

"Danckaerts viewed his surroundings through the eyes of a fanatical self-satisfaction. For this reason his criticisms or strictures upon persons and conditions are to be received with much discount. But he was an intelligent man, and a keen-eyed and assiduous note-taker; and the variety and fecundity of his material is not a little due to the trivial and relatively unimportant details which are embodied in the narrative."

After such a masterly and concise review not much more need be said. Mention, however, should be made of the two introductions—the first by Dr. James, the second by Dr. Jameson, if only to signal the value they have in acquainting us with the historic status of the religious and communal sect founded by Jean de Labadie, and for which Danckaerts and his companion, Sluyter, traveled to America to explore the eastern coastlands, and in consequence of which a Labadist community was afterwards founded in Maryland. The results of these explorations are an exceedingly minute description of New York and its surroundings, of the Hudson, Albany, and as far as west of Schenectady, of New Jersey, and parts of Delaware and Maryland to the line of Virginia. Geographically this description is highly valuable. It presents a vivid picture of the country as it was in 1679, and of its flora, fauna and hydrography. Careful notes on the weather of every day, while not precise, of course, still afford points of comparison with climatic conditions of later periods when properly scrutinized. Not less interesting is his ship journal for the abundant notes on conditions of the sea. Danckaerts's previous voyage to Surinam in Guiana had evidently opened his eyes to many maritime and nautical phenomena. It is noteworthy that he places the origin of the Gulf Stream at the mouth of the Amazon.

Descriptions of larger towns and cities like London, New York, Boston, are somewhat distorted by his patriotism as a Hollander, but his picture of everyday life in streets and homes is interesting while not always complimentary to the people. The remarks of Dr. James about exaggerated critical inclinations in that direction are to be treasured. On the whole the book yields much more than the title leads one to expect, and the editors deserve thanks for what they have undertaken and successfully carried out.

AD. F. BANDELIER.

The Vikings. By Allen Mawer. Cambridge Manuals of Science and Literature. 150 pp. Ills., index. University Press, Cambridge. G. P. Putnam's Sons, New York, 1913. 1s. 6½ x 5.

The term "Viking," meaning "one who haunts a bay, creek or fjord," came to be used, in the ninth and tenth centuries, to designate those warriors of Scandinavia who raided the chief European countries. Until within the last half-century our knowledge of these people was obtained almost entirely from the works of mediæval Latin chroniclers who, writing in monasteries and similar places of learning, had often felt the ruthless hand of the Viking freebooter. Naturally, therefore, the Vikings' cruelty and violence is emphasized and made predominant in the picture which these early historians drew.

During the past fifty years, however, a more comprehensive picture has been given us of the Vikings. This latest conception is obtained from early Scandinavian literature and through the work of archæologists of the last century. The word "Viking," in its recent broader meaning, includes that entire period of Scandinavian civilization, conquest and influence extending approximately from the middle of the Eighth to the end of the Tenth, or the first half of the Eleventh Century. Mr. Mawer deals concisely and in an interesting way with the Vikings in this wide and inclusive sense.

WILBUR GREELEY BURROUGHS.

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The Municipalities of the Roman Empire. By James S. Reid. xv and 548 pp. Index. University Press, Cambridge. G. P. Putnam's Sons, New York, 1913. 9 x 6.

A most valuable work. It is not a book to be cursorily read. It must be carefully studied. Not a word, still less a sentence, is to be overlooked, lest the thread be lost in the enormous accumulation of facts. The treatment of these facts is, however, logical but of rare terseness. It may be said that there is a decided leaning towards admiration of everything Roman, yet it is not at all offensive, and justice is done to other influences not emanating from Latin sources. Dr. Reid's appreciation of Hellenic culture and its intellectual power in the Roman world is not only just but, in many instances, highly complimentary. In a word, he judges with great impartiality and always on the basis of vast material. The book gives an exceedingly detailed picture of the political geography of the Roman Empire and its gradual development. There is hardly a settlement that is not mentioned and, what is most important, accurately located as far as possible. The book may be regarded as a political map of ancient Rome in words; and much is given regarding the physical geography of the vast area covered, hydrography, orography, the vegetation as far as culture plants, indigenous and imported, affected Roman civilization and were in turn affected by it. In short, it is a vivid description of the land of ancient Rome, its people and its vicissitudes to the Fifth Century, the time of its dissolution. AD. F. BANDELIER.

Geschichte der Türken. Von Dr. Albrecht Wirth. 2. verbesserte und vermehrte Auflage. 115 pp. Ills., index. Franckh'sche Verlagshandlung, Stuttgart, 1912. Mk. 2. 10½ x 7.

This is an essentially popular sketch of Turkish history in Europe which will serve the purposes of ordinary reference. The upheaval of the Balkan States provided the occasion for this edition in which the record of events has been brought down to December, 1912. Without pretence of being more than an occasional book and in no sense intended to take the place of greater historical treatises this brief narrative will be found to contain an astonishingly large amount of those details of Turkish history which are in general so hard to find. The richness of this detail would have been brought to better use by an index better than that which the volume has received.

The History of the Italian-Turkish War, Sept. 29, 1911, to Oct. 18, 1912. By Commodore W. H. Beehler. 118 pp. Maps. Reprinted with additions from *Proceedings of the U. S. Naval Institute.* W. H. Beehler, Annapolis, Md. $1. 9½ x 6½.

Based upon semi-official and other reliable data. A straightforward account of the origin, progress and conclusion of the war by a distinguished naval officer who describes the conditions under which war was made and tells the whole story without technical detail, mentioning all facts that were important in shaping events and results.

ECONOMIC AND COMMERCIAL GEOGRAPHY

Mémoire sur les Travaux du Conseil Permanent International pour l'Exploration de la Mer pendant les Années 1902-1912. Redigé par C. F. Drechsel. 83 pp. Copenhagen, 1913. 10½ x 8½.

Published in German and English. The International Investigation of the Sea has been carried on by all the countries bordering on the North Sea and the Baltic for eleven years. The United States is in future to participate in the work. The International Council in September last year decided that a memorandum should be prepared, with the assistance of special experts, on the organization of this work, its programme and the results thus far achieved. The work has been comprehensive and the regions studied have included large parts of the Atlantic from the Arctic circle to the coast of Africa, the North Sea and the Baltic, with the waters between them. The Mediterranean also has, at times, been the scene of observations.

The Bureau has published an important amount of literature, giving the results of this study. This material is available to all who desire to study closely the results of the work. This memorandum, however, is most welcome because it gives the results in concise form conveying to any intelligent reader a good idea of the purposes and work of the Bureau. The memorandum is divided into two parts, the first giving the objects, programme, and organization, and the second describing the work carried out and its more important results. The most essential object of investigation is to procure the necessary data for international agreements as to protecting fisheries from overfishing and the establishment of measures for the improvement of the fisheries.

Maritime Enterprise, 1485-1558. By James A. Williamson. 416 pp. Index. Clarendon Press, Oxford, 1913. Oxford Univ. Press, New York. $4.75. 9 x 6.

One of the themes in this work is to make it plain why England, with a more modern record of dominance of the sea, was so backward in coming into enjoyment of the great discoveries in the Americas. Contributory to this theme is a careful study of the character of Sebastian Cabot. Mr. Williamson, with the aid of fresh study of the evidence, reaches the conclusion that, while Sebastian was a not particularly noble seafarer nor bigoted in his veracity, yet he was not so complete a liar as has been thought. The maritime backwardness of England is analyzed in its connection with the laws of trade based upon the wholly medieval foundations of the wool staple and cloth industry. The writer closes his investigation at the point where the English merchants were ridding themselves of the distributing machinery of the Hanseatic League and taking over command of sea carrying trade for themselves. The work thus serves as a very satisfactory introduction to Froude's "English Seamen of the Sixteenth Century." WILLIAM CHURCHILL.

The Geology of Soils and Substrata, with special reference to Agriculture, Estates, and Sanitation. By Horace B. Woodward. xvi and 366 pp. Ills., index. Longmans, Green & Co., New York, 1912. $2.50. 7½ x 5.

This book contains a vast amount of information concerning soils and bed rock in a great variety of relationships. It is written largely from the point of view of England and Wales and is intended for a practical treatise for students and teachers of agriculture, superintendents of estates and engineers. The first part of the book is a general discussion with a wide range of subjects; weathering, analyses, fertility, drainage, manures, orchards, mineral rights, sites for houses, sewage, cemeteries, and so on. The second part treats of the geological formations of England and Wales beginning with the recent (Quaternary) deposits and the succeeding chapters with formations going back through the geologic ages to the Archæan. In each case the chief characteristics of the formation are given, the localities where it is found are described and the uses and values of the areas for agriculture or for building sites are indicated. ROBERT M. BROWN.

The Conquest of Bread. By P. Kropotkin. xvi and 298 pp. Chapman & Hall, Ltd., London, 1913. 1s. 7 x 4½.

"In our civilized societies," writes Kropotkin, "we are rich. Why then are the many poor? Why this painful drudgery for the masses?"

In this book he answers these questions, and going further he outlines, carefully and in detail, the programme that would be followed by the Socialists if a Communist revolution were to take place in any nation or group of nations. He considers the various objections offered to the Communism which he upholds, and answers these objections from his own point of view.

WILBUR GREELEY BURROUGHS.

Unsere Kohlen. Von Paul Kukuk. Series: Aus Natur und Geisteswelt. ix and 120 pp. Map, ills., index. B. G. Teubner, Leipzig, 1913. Mk. 1.50. 7½ x 5.

This handy little volume is "an introduction to the geology of coal, includ-

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ing its production, uses and economic importance,'' and can be said to contain everything which a person of general culture ought to know about this important mineral. It explains the formation of carboniferous rocks, the special chemical and physical properties of coal, coal mining, the uses of coal and its many by-products, and, what is of most importance to the geographer, it contains also a very exhaustive synopsis of the geographical distribution of coal fields in the various continents. An appendix gives a number of interesting statistics. Numerous illustrations, most of them made expressly for the book, a map of the coal fields of northwestern Europe, and an alphabetical index add to its usefulness. M. K. G.

METHODOLOGY AND TEACHING

Modern Geography for High Schools. By Rollin D. Salisbury, Harlan H. Barrows and Walter S. Tower. American Science Series. viii and 418 pp. Maps, ills., index. Henry Holt & Co., New York, 1913. 8 x 5½.

This, the second of the new type of High School Geographies to appear, is an abridgment of the ''Elements of Geography'' by the same authors. The two books are identical in plan and scope; there are the same number of chapters, the same chapter-titles and almost the same subdivisions of chapters. The High School book is made by omitting paragraphs, sections and illustrations from the earlier book. They are alike in devoting a large proportion of space to the atmosphere and climate. Climate is unquestionably a very important topic in geography, but it is questionable whether it deserves over one-fourth of the entire space. The absence of emphasis upon land forms marks a big change from the physical geographies of the last fifteen years.

The paragraphs are thoroughly boiled down; some will say too much so. There is an immense amount of material in the 400 pages. It is presented in clear and simple language, but it must be taken in smaller doses than the ordinary. Six of the twenty-one chapters are of the type commonly called humanized geography. They deal with those phases of the subject which have a more or less ''practical'' value—waterways, irrigation, reclamation, harbors, industries, resources, cities, and the like. Two of these chapters develop excellently the relationships between man and his geographical environment; they are the chapters on mountains, plateaus and plains. There are seven physical maps in colors at the end of the book; also a carefully selected list of reference books.

Like the earlier book, the later one will be welcomed as an added impulse to a movement in the right direction. Books of this type will give new life to a subject which, in a very large number of schools, has, of late, been on the defensive. R. H. WHITBECK.

Globes and Maps in Elementary Schools. A Teachers' Manual. By Leon O. Wiswell. 64 pp. Ills., index. Rand, McNally & Co., New York, 1913. 7½ x 5.

A small manual containing a series of elementary exercises in mathematical geography and designed to instruct pupils in the use of maps and the globe. There are globe exercises for grades 4, 5, 6, 7 and 8, and additional exercises suited to the lower classes in the secondary school. There is also a group of exercises dealing with the purpose, the reading, sketching and drawing of maps, and instructions on the care of maps. The manual closes with a suggested course of map lessons. It does not presuppose any expensive equipment; its use will aid in making clear the meaning of maps, and in teaching the fundamentals of mathematical geography. R. H. WHITBECK.

Notions Générales. L'Amérique, l'Océanie, l'Asie et l'Afrique. Première Année. Par F. Schrader et L. Gallouédec avec la collaboration de F. Maurette. viii and 445 pp. Maps, ills. Hachette et Cie., Paris, 1912. Fr. 3.50. 7½ x 5.

This book is designed for pupils in those normal schools of France which

prepare teachers for grade schools. This volume opens with the presentation of North and South America, Oceania, Asia and Africa. The treatment is threefold; first, a brief résumé of the facts which the teacher should know; second, descriptions with photographs of picturesque traits of physical and human geography for the purpose of exciting the imagination; third, explanations of the most characteristic, the most difficult or the most suggestive facts. The serious fault of the book lies in the first of these. The mere recital of facts apart from causes or effects cannot be countenanced as good pedagogy. The book would be more powerful and the pupils of the normal schools would probably be imbued with a greater array of facts if they were presented to them on some rational plan rather than as collections of data.

ROBERT M. BROWN.

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THE SERVIAN PEOPLE, THEIR PAST GLORY AND THEIR DESTINY. By Prince Lazarovich-Hrebelianovich with the collaboration of Princess Lazarovich-Hrebelianovich. Vol. 1: xvi and 419 pp. Vol. 2: pp. 420-742. Ills., index. C. Scribner's Sons, N. Y., 1910. $5. 9 x 6.

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NEW MAPS

EDITED BY THE ASSISTANT EDITOR

For system of listing maps see p. 74 of this volume

NORTH AMERICA

UNITED STATES

Massachusetts. Vegetation of Nantucket. [1:150,000]. 41°24′ - 41°14′ N.; 70°21′ - 69°57′ W. Accompanies, on p. 72, "The Vegetation of Nantucket" by J. W. Harshberger, *Bull. Geogr. Soc. Philadelphia*, Vol. 12, 1914, No. 2, pp. 70-79.

[Helpful phytogeographical map distinguishing between sand dune vegetation, heath, oak heath, salt marsh, marsh, deciduous woods, introduced pine, and farmland.]

SOUTH AMERICA

Argentina. Vegetationskarten aus dem Nordwesten Argentiniens (Calchaquitäler und Puna de Atacama). Entworfen und gezeichnet von Dr. Hans Seckt. 1:80,000. [Three maps (scale of all three given only on second):] I: Vegetationskarte des Tales von Cachi adentro (Calchaquitäler). [25° S. and 66⅓° W.]. Oriented N. 45° W. 14 colors. II: Vegetationskarte des Tales von Peñas Blancas (Calchaquitäler). [24¾° S. and 66¼° W.] 13 colors. III: Vegetationskarte der Quebrada de Azufre (Puna de Atacama). [24⅗° S. and 66⅝° W.]. Oriented N. 43° W. With inset: Übersichtskarte der Expedition. 1:3,500,000. 24° - 27° S.; 70¾° - 65⅓° W. 4 colors. Accompanies, as Taf. 17, "Vegetationsverhältnisse des nordwestlichen Teiles der Argentinischen Republik (Calchaquitäler und Puna de Atacama)" (first part) by H. Seckt, *Petermanns Mitt.*, Vol. 60, I, 1914, Feb., pp. 84-85.

[Detailed vegetational maps of the upper part of valleys heading in the eastern border of the Andean highland. Critical physical features and distribution of characteristic plants shown.]

AFRICA

French Sudan. Reconnaissance effectuée par le commandant J. Tilho dans les "Pays-Bas" du Tchad du 18 juin au 11 août 1913. 1:5,000,000. [19° - 13° N.; 14⅓° - 22⅓° E.] Accompanies, as Fig. 52 on p. 373, "Reconnaissance dans les 'Pays-Bas' du Tchad (18 juin-11 août 1913)" by J. Tilho, *La Géogr.*, Vol. 28, 1913, No. 6, pp. 372-374.

[Reconnaissance to the northeast of Lake Chad: distinguishes between desert, steppe, and cultivable area.]

ASIA

Celebes. Topographische Skizze aus dem Ostarm der Insel Celebes. Aufgenommen im Februar und März 1905 von Dr. J. Wanner. 1:250,000. 0°36′ - 1°31′ S.; 122°12′ - 123°3′ E. 4 colors. With inset showing extent of main

map: Das auf der Karte dargestellte Gebiet des Ostarms. [1:12,500,000]. Accompanies, as Taf. 16, "Eine Reise durch Osteelebes" (first part) by J. Wanner, *Petermanns Mitt.*, Vol. 60, I, 1914, Feb., pp. 78-81.

[Valuable route survey: relief in contours (interval, 100 meters). Cf. also the maps of central Celebes listed under "Celebes" in the *Bull.*, Vol. 43, 1911, p. 549 (two items) and Vol. 45, 1912, p. 157.]

India. The Siachen or Rose Glacier and Tributaries in the Eastern Karakoram. Explored by the Fanny Bullock-Workman Expedition. 1912. 1:175,000. 35°44′ - 35°9′ N.; 76°33′ - 77°18′ E. 2 colors. With two insets: (1) Diagram of Triangulation of the Siachen Glacier. 1:500,000. (2) [Map of northern India showing location of main map]. 1:30,000,000. Accompanies "The Exploration of the Siachen or Rose Glacier, Eastern Karakoram" by F. B. Workman, *Geogr. Journ.*, Vol. 43, 1914, No. 2, pp. 116-148.

[Important large-scale map of this longest (46 miles) glacier of the Karakoram Range, based on a trigonometrical plane table survey by C. Grant Peterkin. Snow-covered crests in bluish shading, exposed rock in hachuring and moraines in stippling in brown. A note on the map gives the sources used for the sections not surveyed by the expedition. Cf. Dr. Longstaff's map of the Eastern Karakorams under "India" in the *Bull.*, Vol. 42, 1910, p. 876; also other maps of the Karakorams under "Himalaya," in Vol. 42, 1910, p. 399, and under "India," Vol. 43, 1911, p. 957.]

India. (a) From Rawal Pindi to the Baltoro Glacier: Itinerary of the expedition of H. R. H. the Duke of the Abruzzi, from April to August 1909. 1:1,000,000. 36°16′ - 33°37′ N.; 73°0′ - 77°0′ E. 3 colors.

(b) Portion of the Karakoram Range (Western Himalaya). Drawn from the photogrammetric survey of the Expedition of H. R. H. the Duke of the Abruzzi, based upon the triangulation of the G. T. S. of India (N. W. Himalaya Series) and upon the Survey of Sir W. M. Conway, 1902. 1:100,000. 35°58′ - 35°34′ N.; 76°14′ - 76°44′ E. 4 colors.

(c) Portion of the Karakoram Range (Western Himalaya). Stations from which photogrammetric and ordinary panoramas and tacheometre and compass observations were taken for the survey of the district explored by H. R. H. the Duke of the Abruzzi. Same scale and coordinates as map (b). 4 colors.

Accompany, in separate pocket, "Karakoram and Western Himalaya, 1909: An Account of the Expedition of H. R. H. Prince Luigi Amedeo of Savoy, Duke of the Abruzzi" by F. De Filippi, London, 1912.

[Map (a) a general map showing the route of the expedition from the railroad to the Karakoram Range; relief in brown shading. Map (b) is the detailed survey by the expedition of the upper end of the Baltoro Glacier: snow-covered portions in approximate blue contours, exposed rock in hachures and moraines in stippling in brown. Map (c) is the same as map (b) with the addition, in red, of the sights taken from the various photogrammetric stations.]

Tibet. Capt. F. M. Bailey's Route to the Falls of the Tsang-po, 1913. 1:850,000. 30°5′ - 29°15′ N.; 94°48′ - 95°40′ E. With inset showing location of main map. Accompanies, on p. 185, "Note on the Exploration of the Tsang-po" by F. M. Bailey, *Geogr. Journ.*, Vol. 43, 1914, No. 2, pp. 184-186.

Turkey in Asia. Esquisse de l'Yémen. Reconnaissances de Mr. A. Beneyton, Ingr. 1:2,000,000. 15°55′ - 12°50′ N.; 42°50′ - 45°7′ E. Accompanies, on p. 263, "Mission d'études au Yémen" by A. Beneyton, *La Géogr.*, Vol. 28, 1913, No. 4, pp. 201-219.

Turkey in Asia. Sketch Map showing Railway Surveys in Yemen. 1:2,000,000. 15⅕° - 12⅖° N.; 42⅖° - 45⅙° E. Accompanies, facing p. 66, "Railway Surveys in Yemen," *Geogr. Journ.*, Vol. 43, 1914, No. 1, pp. 66-68.

[North of 13½° N. this map is based on the map in *La Géographie* listed immediately above; south of that latitude, on the map of Arabia and the Persian Gulf, 1908, by Capt. F. F. Hunter of the Survey of India. Relief in hachures.]

XUM

Turkey in Asia. Reise von Mossul nach Wan (Zentralkurdistan). Nach Originalaufnahmen von Dr. Bachmann 1911. 1:200,000. 3 colors. [Three sheets:] (1) Blatt I: Von Mossul bis Amadia. 37°6′ - 36°19′ N.; 43°0′ - 43°40′ E. (2) Blatt II: Von Amadia bis zum Harefta Dagh. 37°48′ - 37°4′ N.; 43°15′ - 44°0′ E. (3) Blatt III: Vom Harefta Dagh bis Wan. 38°34′ - 37°45′ N.; 43°15′ - 44°15′ E. With inset: Übersicht zu Dr. W. Bachmanns Reisen in Zentralkurdistan (Mossul-Wan). 1:2,000,000. 39⅕° - 35½° N.; 41½° - 46° E. 2 colors. Accompany, as Taf. 1, 2 and 3, "Bericht zur Routenkarte von Mossul nach Wan" by W. Bachmann, *Petermanns Mitt.*, Vol. 60, I, 1914, Jan., pp. 21-25.

[Valuable survey of more direct although less frequented route between Mosul and Van than the usual one via the upper Tigris and Bitlis. Relief in brown contour-shading, drainage in blue, cultivated areas in green, author's route in red.]

EUROPE

Belgium. (a) Carte linguistique des environs de Bruxelles, d'après le recensement de 1900. 1:200,000. 50°54′ - 50°41′ N.; 4°12′ - 4°31′ E.

(b) Carte linguistique des environs de Bruxelles, d'après le recensement de 1910. Same scale and coordinates as map (a).

Accompany, as Figs. 48 and 49 on pp. 310 and 312 respectively, "Les progrès du Français dans l'agglomération bruxelloise" by P. Reclus, *La Géogr.*, Vol. 28, 1913, No. 5, pp. 308-318.

England. (a) The Southern Pennines. [1:2,000,000]. [54°25′ - 52°30′ N.; 3°20′ W. - 0°30′ E.]. [Five maps:] (1) Census Districts and Towns. (2) Density of the Population in 1801. (3) Density of the Population in 1851. (4) Density of the Population in 1901. (5) Changes in the Population during the Nineteenth Century.

(b) Nottinghamshire. [Five maps, the first four, 1:500,000, the last, 1:750,000]. [53°30′ - 52°45′ N.; 1°20′ - 0°37′ W.]. (1) Density of the Population in 1801. (2) Density of the Population in 1851. (3) Density of the Population in 1901. (4) Changes in the Population during the Nineteenth Century. (5) Summary of Population Changes during the Nineteenth Century.

(c) Nottinghamshire Collieries. [1:800,000]. [52°52′ - 53°25′ N.; 1°20′ - 1°0′ W.]. [Seven maps:] (1) 1811. (2) 1854. (3) 1861. (4) 1871. (5) 1881. (6) 1891. (7) 1901.

(d) Nottinghamshire Railways during the Nineteenth Century. [1:1,600,000]. Coordinates as under (b). [Seven maps:] (1) 1842. (2) 1851. (3) 1861. (4) 1871. (5) 1881. (6) 1891. (7) 1901.

Accompany: maps under (a), as Figs. 1, 2, 3, 4 and 5 on pp. 35, 36, 37, 38 and 40, respectively; maps under (b), as Figs. 6, 7, 8, 9 and 10, on pp. 42, 43, 44, 46, and 47, respectively; maps under (c) as Fig. 12 on p. 51; and maps under (d) as Fig. 15 on p. 55, "Nottinghamshire in the Nineteenth Century: The Geographical Factors in the Growth of the Population" by B. C. Wallis, *Geogr. Journ.*, Vol. 43, 1914, No. 1, pp. 34-61.

[Black-and-white sketch maps illustrating a detailed study of Nottinghamshire. The symbols to show gradation have not been very felicitously chosen for Figs. 4, 7 and 8, where the same series of symbols is used for the higher density grades as for the lower, except for a heavy black bordering line. Thus, except for this differentiation, the densities 0-128 and 1153-1280 both appear white, necessitating a mental adjustment to the legend in order to avoid misconceptions. To be sure, the great number of symbols required (maximum of 18 on Fig. 4) presents a formidable problem when restricted to representation in black-and-white only.]

Germany. Schnellzugskarte des Deutschen Reiches. Entworfen von Reg.-Ass. H. v. Hedemann. Mean scale 1:2,200,000. [55½° - 46½° N.; 4° - 23° E.]. 1 color. Accompanies, as Taf. 9, "Schnellzugskarte des Deutschen Reiches" by H. v. Hedemann, *Petermanns Mitt.*, Vol. 60, I, 1914, Jan., p. 30.

[Diagrammatic map showing, by the number of lines, the number of express trains running in one direction on the main railroads of Germany.]

Italy. Morphologische Karte des Monte Argentario (Toskana). Auf Grund italienischer Karten und eigener Beobachtungen gezeichnet von G. Braun, 1913. 1:1,000,000. 42°30.5′ - 42°20.0′ N.; 1°25′ - 1°0′ W. 6 colors. Accompanies, as Taf. 8, "Der Monte Argentario in Toskana" by G. Braun, *Petermanns Mitt.*, Vol. 60, I, 1914, Jan., pp. 17-20.

[Example of an island tied to the mainland by two tombolos.]

POLAR

Antarctic. Sketch Map to illustrate the paper by Raymond E. Priestley on the Work of the Northern Party, British Antarctic Expedition, 1910-13. [Two maps:] (1) [Robertson Bay]. 1:500,000. [71½° S. and 170° E.]. (2) [Vicinity of Terra Nova Bay]. 1:500,000. [74½° S. and 164° E.]. With inset showing extent of main maps: [South Victoria Land]. 1:5,000,000. 70° - 78° S.; 160° - 180° E. Accompany "Work and Adventures of the Northern Party of Captain Scott's Antarctic Expedition, 1910-1913" by R. E. Priestley, *Geogr. Journ.*, Vol. 43, 1914, No. 1, pp. 1-16.

Antarctic. South Polar Regions showing the proposed routes of the Trans-Antarctic Expedition, 1914. 1:60,000,000. Polar cap within about 50° S. Accompanies, on p. 175, "The Imperial Trans-Antarctic Expedition, 1914" by E. Shackleton, *Geogr. Journ.*, Vol. 43, 1914, No. 2, pp. 173-178.

WORLD AND LARGER PARTS

World. Die Verbreitung der Wildschafe. Entworfen von Dr. Rud. Kowarzik. [Asia]. 1:20,000,000. 80° - 22° N.; 20° - 180° E. 2 colors. With four insets: (1) [Sardinia and Corsica]. 1:3,700,000. 43° - 38¾° N.; 8° - 10° E. 2 colors. (2) Vorderasien. 1:15,000,000. 43° - 34° N.; 30° - 50° E. 2 colors. (3) Alaska. 1:25,000,000. 71° - 53° N.; 175° - 120° W. 2 colors. (1) Westl. Nordamerika. 1:25,000,000. 57° - 23° N.; 130° - 94° W. 2 colors. Accompanies, as Taf. 15, "Die Verbreitung der Wildschafe: Ein interessantes Kapitel moderner Tiergeographie" by R. Kowarzik, *Petermanns Mitt.*, Vol. 60, I, 1914, Feb., pp. 70-72.

[Suggestive map showing the distribution of wild sheep and supporting Matschie's hypothesis that drainage divides constitute the limits of each species.]

World. Sketch Maps to illustrate the paper by Prof. J. W. Gregory, D.Sc., F.R.S., entitled "Is the Earth Drying Up?" [Three maps:] Map I: Annual Isotherms (Fahrenheit), Mediterranean Region. 1:40,000,000. 60° - 27° N.; 20° W. - 60° E. Map II: Map illustrating the Southern Position of the low pressure track in Glacial Times. Central scale 1:80,000,000. 90° - 100° N.; 110° W. - 70° E. Map III: Map illustrative of the Question of the change in Precipitation. [Mercator's projection, equatorial scale 1:180,000,000]. Zone between 79° N. and 60° S. Accompany "Is the Earth Drying Up?" (first part) by J. W. Gregory, *Geogr. Journ.*, Vol. 43, 1914, No. 2, pp. 148-172.

[Map II illustrates, after Köppen, the probable diversion to the south of the chief routes of the low pressure areas during the Glacial Period. Map II distinguishes between localities where there is evidence of no change or of more humid or drier climatic conditions in historic time.]

Other Maps Received

NORTH AMERICA

United States. Outline Map of the United States by Counties. [1:5,800,000]. [Three editions: (1) without county names; with county names in (2) pale blue and (3) black.]. U. S. Department of Agriculture, Washington, 1910.

XUM

AFRICA

Africa. Carte d'Afrique, par F. Schrader, F. Prudent, E. Anthoine, Dressée par M. Chesneau. 1:15,000,000. [From: Atlas de Géographie Moderne]. Librairie Hachette & Cie., Paris, 1913.

Portuguese West Africa. Africa Occidental Portugueza; Esboço chorographico da Provincia d'Angola. 1:1,000,000. Folha no. 7, Benguella; no. 8, Huilla, 1906; no. 11, Bihé e Moxico; no. 15, Moxico. Ministerio da Marinha Ultramar, Commissão de Cartographia, Lisboa, 1905.

ASIA

China. A map of China, prepared for the Chinese Inland Mission. 1:3,000,000. Chinese Inland Mission, London, 1913.

India. Geological map of India and adjacent countries. 1:2,027,520. Geological Survey of India. Calcutta, 1909.

The Karakoram Himalayas. Sheet I, Bagrot, Hunza, Nagyr & the Hispar Glacier; II, The Biafo & Baltoro Glaciers. 1:126,720. The Royal Geographical Society, London, 1894.

Mongolia. Map of Mongolia. 200 versts to the inch (1:8,400,000). Ilyin's Cartographical Establishment, St. Petersburg (1912). 20 kopeks. [In Russian].

Tibet. Tibet and the surrounding regions. 1:3,800,000. Royal Geographical Society, London, 1906.

AUSTRALASIA AND OCEANIA

Western Australia. Geological sketch map of Western Australia. 100 mi. to 1 in. Geological Survey of Western Australia, Perth.

Geological Map of Kalgoorlie. 10 chains to 1 inch. Geological Survey of Western Australia, Perth, 1902.

Geological Map of Northampton by A. Gibb Maitland. 20 chains to 1 inch. Department of Mines, Perth, 1898.

Mining map of the Boulder Belt, East Coolgardie, G. F. 4 chains to 1 inch. Geological Survey of Western Australia, Perth, 1900.

EUROPE

Austria-Hungary. Freytags Eisenbahn-Wandkarte von Österreich-Ungarn. 1:750,000. Insets: Umgebung von Wien, 1:250,000; Umgebung von Budapest, 1:125,000; Umgebung von Prag, 1:200,000; Norwest-Böhmen, 1:300,000; Verkehrskarte der Balkanhalbinsel, 1:1,500,000. Freytag & Berndt, Wien.

G. Freytags Verkehrskarte von Österreich-Ungarn. 1:1,400,000. Freytag u. Berndt, Wien, 1914.

G. Freytags Karte der Umgebung von Bozen, 1:150,000, mit den Stadtplänen von Bozen-Gries, 1:12,000, und Meran, Ober- und Untermais, 1:12,000. Freytag & Berndt, Wien. 60 Heller.

Freytags Skirouten-Karte [a] des Berchtesgadnerlandes und Pinzgaues, [b] des Grazer Bergland, [c] des Östlichen Salzkammergutes, [d] des Ennstales und der Rottenmanner Tauern, [e] der Niederösterr.-Steirischen Kalkalpen (Westliches Blatt), [f] der Niederöst.-Steir. Kalkalpen (Östlicher Teil), [g] des Unteren Mürztales und des Hochschwabgebietes. 1:100,000. Freytag & Berndt, Wien. Kr. 2 each.

Karte der Lechtaler-Alpen, Arlberg-Gebiet. 1:25,000. Freytag & Berndt, Wien, 1913.

Strassen-Karte des Erzherzogthumes Österreich unter der Enns. 1:75,000. Verlag von R. Lechner, k. u. k. Hof- und Univ.-Buchhandlung, Wien, 1903.

Handkarte des politischen Bezirkes Baden. 1:150,000. Freytag & Berndt, Wien.

Karte des politischen Bezirkes Floridsdorf-Umgebung. 1:200,000. Freytag & Berndt, Wien, 1910.

Karte des politischen Bezirkes Gänserndorf. 1:200,000. Freytag & Berndt, Wien.

Karte des Bezirkes Krumman. 1:150,000. Anstalt G. Freytag & Berndt, Wien. Heller 30.

Historisch-Geogr. Plan der Stadt Marburg a. d. Drau. von Dr. M. Hoffer. 1:10,000. Freytag & Berndt, Wien, 1913.

Kunsthistorischer Plan des I. Bezirkes der k. k. Reichshaupt- und Residenzstadt Wien. Aufgenommen von Prof. Dr. H. Hassinger. 1:10,000. Freytag & Berndt, Wien, 1912. 60 Heller.

Austria-Hungary—Balkan States. Neue Bahnprojekte in Österreich-Ungarn und den Balkanstaaten, bearbeitet von G. Freytag. 1:1,500,000. Freytag & Berndt, Wien, 1914. K. 2.

Balkan States. G. Freytags Karte der Balkan-Halbinsel. 1:1,250,000. Freytag & Berndt, Wien. K. 1.20.

I paesi balcanici, la Grecia ed i limiti dell' Impero Ottomano in Europa. 1:2,000,000. G. B. Paravia & Co., Torino, 1914.

Die zentralen Balkanländer zwischen Adria u. Pontus. Auf Grundlage der II. Ausgabe von Scheda's Balkankarte. Bearbeitet von Dr. Karl Peucker. 1:864,000. V. Auflage 1914. Artaria & Co., Wien, 1914.

Karte des Fürstentums Albanien. 1:600,000. Freytag & Berndt, Wien. Kr. 1.

British Isles. Bartholomew's "Half-inch to mile" map of England and Wales. Sheet 3, Cumberland, the Lake District. 2 mi. to 1 in. Edinburgh, John Bartholomew, [1913]. 2 shillings.

Denmark. Borris Sönderland Specialkort i 1:20,000. Generalstaben, Kjöbenhavn, 1907.

Germany. Karte vom Schwarzwald. 1:400,000. Otto Weber, Heilbronn, 1914.

(1) Jever. (Gradabtheilung 142, Blatt 1017). Geognost. und agronom. bearbeitet. 1:25,000. (2) Agronomische Bohrungen zu Blatt Jever. With accompanying text. 140 pp. Oldenburgische Landwirtschafts-Gesellschaft, Oldenburg, 1898.

Italy. Carta amministrativa stradale della Provincia di Alessandria. 1:250,000. Novara, Istituto Geografico de Agostini. [1913]. Lire 0.60.

Switzerland. Uebersichtskarte der Schweiz mit ihren Grenzgebieten. 1:1,000,000. Eidg. topogr. Bureau, Bern, 1912.

Carte officielle des postes suisses avec indication des bureaux de télégraphe et des chemins de fer. 1:250,000. Direction Générale des Postes Suisses, Berne, 1912.

WORLD AND LARGER PARTS

World. Official wireless map of the world, compiled by Marconi's Wireless Telegraph Co. [Mercator's projection: equatorial scale, 1:48,300,000.] Geo. Philip & Son, Ltd., London, 1913. 2/6.

World. The Navy League Map, illustrating British Naval History. [Mercator's projection: equatorial scale, 1:22,600,000.] W. & A. K. Johnston, Edinburgh, 1913.

EDUCATIONAL

Austria. Schulwandkarte des politischen Bezirkes Feldbach. 1:50,000. Freytag & Berndt, Wien, 1913.

Schulwandkarte des politischen Bezirkes Baden. 1:25,000. Freytag & Berndt, Wien, 1911. Kr. 36.

Schulwandkarte des Erzherzogtums Österreich unter der Enns, bearbeitet von J. G. Rothaug und Dr. F. Umlauft. 1:150,000. Freytag & Berndt, Wien.

Schulhandkarte der Bezirkshauptmannschaft Liesen, . . . von L. Comai . . . und A. Bischofberger . . . 1:200,000. G. Freytag & Berndt, Wien. 32 Heller.

XUM

The Netherlands. Twaalf Wandkarten der Vaterlandsche Geschiedenis door J. W. de Jongh: No. 1, Nederland vóór ten tijde der Romeinen; 2, Nederland omstreeks 1300; 3, 1543; Karel V. heer over de zeventien nederlandische gewesten; 4, De tachtigjarige oorlog; 5, Beleg en ontzet van Leiden in 1574; 6, De overzeesche bezittingen der republiek in de 17e eeuw; 7, De gevestigde republiek der Vereenigde Nederlanden, 1648; 8, Het jaar 1672. Inset: De hollandsche waterlinie; 9, Middel-Europa in de eeuw van Lodewijk XIV; 10, (a) De Bataafsche Republiek van 1798 tot 1801, (b) Het bataafsch gemeenebest van 1801 tot 1806, (c) Het Koninkrijk Holland van 1806 tot 1810, (d) Holland, een fransch wingewest van 1810 tot 1813; 11, Het Koninkrijk der Nederlande van 1814 tot 1839; 12, Groei en bloei van onze Oost-Indische Bezittingen.

With accompanying text: Toelichting bij de twaalf historische wand-kaarten der vaderlandsche geschiedenis met gekleurde photo-lithographische reproducties en eenige illustraties, door J. W. de Jongh. Joh. Ykema, 's-Gravenhage, 1909.

ATLASES

Vaterländischer Geographischer Schulatlas auf heimatlicher Grundlage in Karten und Bildern, bearbeitet von Joh. G. Rothaug. Ausgabe für Böhmen, Preis K. 1.60; Ausgabe für Niederösterreich, Preis K. 2.20; Ausgabe für Schlesien, Preis K. 3. Freytag u. Berndt, Wien, 1912. K. 1.60.

Prof. H. L. Hickmanns Geographisch-Statistischer Universal Taschen-Atlas. G. Freytag & Berndt, Wien, 1914.

Erratum

Central America. Referring to the last sentence of the review of his maps of volcanic regions of Central America in the January *Bulletin* (Vol. 46, 1914), pp. 75-76, Professor Sapper kindly informs us that he had desired that a large-scale general map showing the relationship of the various groups of volcanoes to each other accompany his monograph, but that the editor had not been able to accede to this request inasmuch as maps of this nature had already appeared in previous numbers of the *Ergänzungshefte* and of *Petermanns Mitteilungen*, as follows:

(1) (a) Originalkarte [hypsometric] des nördlichen Mittel-Amerika. Nach eigenen Aufnahmen und allen vorhandenen Quellen entworfen und gezeichnet von Dr. Carl Sapper. 1:1,100,000. 22°20′ - 12°55′ N.; 93°50′ - 86°15′ W. 12 colors. In 2 sheets.

(b) Geologische Karte des nördlichen Mittel-Amerikas. Nach eigenen Aufnahmen und allen vorhandenen Quellen entworfen und gezeichnet von Dr. Carl Sapper. Same scale and coordinates as map (a). 28 colors. In 2 sheets.

Accompany, as Taf. I and II, "Über Gebirgsbau und Boden des nördlichen Mittelamerika" by C. Sapper, *Ergänzungsheft zu Petermanns Mitt. Nr. 127*, 1899.

(2) Geologische Karte des südlichen Mittelamerika von Dr. Karl Sapper. 1:1,750,000. 13°25′ - 7°10′ N.; 87°50′ - 79°30′ W. 19 colors. With inset: Skizze einer Bodenkarte des südlichen Mittelamerika. Von Dr. Karl Sapper, 1903. 1:40,000,000. 16°20′ - 8°0′ N.; 89°20′ - 81°10′ W. 11 colors. Accompanies, as Taf. I, "Über Gebirgsbau und Boden des südlichen Mittelamerika," by K. Sapper, *Ergänzungsheft zu Petermanns Mitt. Nr. 151*, 1905.

(3) Entwurf von Höhenschichtlinien der mittleren Vulkanregion Nicaraguas. 1:300,000. Accompanies, as Taf. 50, paper with same title by same author, *Petermanns Mitt.*, Vol. 59, I, 1913, pp. 310-311.

The *Bulletin* takes pleasure in calling attention *nominatim* to these fundamental maps of Central America. The last was listed in detail, with comment, under Nicaragua in the *Bull.*, Vol. 45, 1913, pp. 716-117.

XUM